

Contents.

Preface.

Chapter One; "Eighteenth Century Experiments" Page 4.

Chapter Two; "Efforts of the Nineteenth Century" Page 61

"SCOTTISH EXPERIMENTS

Chapter Three; "Scottish Experiments" Page 92.

IN RURAL EDUCATION FROM THE

Chapter Four; "Rural Education from the Eighteenth Century to the Present Day," Page 126

EIGHTEENTH CENTURY TO THE PRESENT DAY,

Chapter Five; "Modern Developments" Page 163

WITH SPECIAL REFERENCE TO RURAL ARTS

Chapter Six; "The Work of Individual Schools" Page 193

AND CRAFTS. "

Chapter Seven; "The Quaker Experiment" Page 223.

By

Bibliography.

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Contents.

Preface.

Chapter One; "Eighteenth Century Experiments" Page I.

Chapter Two; "Efforts of the Nineteenth Century" Page 61

Chapter Three; "Among the Specifics" Page 93.

Chapter Four; "Influence of the Nature
Study Movement" Page 126

Chapter Five; "Modern Developments" Page 163

Chapter Six; "The Work of Individual Schools" Page 193

Chapter Seven; "The Queensferry Experiment" Page 223.

Bibliography.

Preface.

The history of rural education in Scotland has been marked by gradual developments towards a social ideal. The experiments which have been attempted in the Scottish rural school during a period of nearly two hundred years, from the Eighteenth Century until the present time, have been inspired by the ideal of establishing a closer relationship between the school and the community, and the trace of progress is distinguished by a gradual rise in effort towards the utilisation of environment as the basis of education. Throughout the whole period it has been realised that academic knowledge can scarcely of itself provide for close contact between school and community, and a solution has been sought by reference to rural industry and to all those influences which are bound up in the rural environment.

Eighteenth Century experiments, conducted mainly under the support and guidance of the Society in Scotland for Propagating Christian Knowledge, were confined to the Highlands of Scotland, to those outposts of industry established through the influence of the Board of Manufactures, where community interests were centred in the arts and crafts necessary to the life and progress of a circumscribed colony,--- the art of agriculture,

the growing of crops for the sustenance of life and the culture of flax for the provision of labour; the art of spinning and weaving; the subsidiary, yet necessary, crafts in leather, wood, and metal. These industries gave direction to the experiments of the schools and formed the basis of the relationship established. The work of the schools was tentative and projective, and its success or failure can only be gauged by reference to the social state. At a time when industry in the Highlands was relatively backward, when tradition and long-established custom proved deterrents to progress, when the influences towards the uplift of village society were few, the task of the schools was beset by many difficulties. A just estimate of the work accomplished will take consideration of the habits of industry inculcated, the skills developed, and the general development of community life.

In the Nineteenth Century, two influences affected rural society and gave rise to an increased interest in the staple rural occupation, the one emerging as a result of the general Science Movement, stimulated by the Science and Art Department, South Kensington, the other as the effect of the Scotch Education Act of 1872. During this period the rural school strove to establish close contact with occupational environment. Agriculture

as a subject of school instruction was largely introduced into the curriculum of the village school, and although the methods employed to attain the end in view were often subject to criticism, the movement marked a step in the advancement of education towards the social ideal.

During the Twentieth Century there has been a gradual development, through the agency of the Nature Study Movement, towards a better appreciation of environment and of community interest. The stress which has been laid upon actual observational work and experimentation has effected changes in educational outlook and in educational method. The various influences which have given stimulus to the movement, the attitude of the Scottish Education Department and of the Colleges of Agriculture, have given opportunity to the rural school for the fuller understanding of all that is embraced in neighbourhood.

At the present time, there are distinct signs that the rural school, from the practical aspect of its work at least, is attempting to satisfy the needs of individual capacity and of the rural community, creating a spirit of enquiry and the habit of thoughtful activity within the social group.

These conclusions have been drawn from an examin-

Chapter One.

ation of the work of the Scottish schools. Information regarding the Eighteenth Century experiments has been derived from the MSS Minutes of the S.S.P.C.K. and the MSS Minutes of the Board of Manufactures, while that regarding Nineteenth Century schools has been found in the Official Publications of the Science and Art Department and of the Committee of Council on Education in Scotland. This latter information has been supplemented by data kindly supplied by schoolmasters. Official Reports, letters, and replies to Questionnaires have furnished particulars regarding modern rural schools.

We are indebted to the schoolmasters, too numerous to mention, who have helped to further this investigation. We owe our thanks to the Secretary of the S.S.P.C.K. and to the Secretary of Trustees, Art Galleries, Edinburgh, for the courtesy of allowing us to peruse the MSS Minutes in their hands.

The Queensferry Experiment, carried out by the author, has been largely assisted by the Staff of the school and by the Edinburgh and East of Scotland College of Agriculture. We are indebted to both for valuable help.

- (1) Brief History of the Society in Scotland for Propagating Christian Knowledge in the Highlands and Islands, by Henry Hunter, London, 1795, Page 18.
(2) Summary Account of the Rise and Progress of the Society in Scotland for Propagating Christian Knowledge, Edinburgh, 1793, Page 11.
(3) Ibid. Page 12.

Chapter One.

Eighteenth Century Experiments.

During the distressing transitional period following the Union of 1707, there came into being a courageous movement to influence the ill-starred Highland Clans for the Protestant Presbyterian Religion and to sway the Celtic mind towards the Government, when the Revolution of 1688 was still fresh "in the recollection, and in the resentment" of so many northern people. (1) The laudable intention originated in the minds of a few private gentlemen of the City of Edinburgh who had formed themselves into a Society "for reformation of Manners" , (2) and who early conceived the plan of establishing schools in the Highlands and Islands as the most effectual means of ameliorating social conditions in the sparsely populated districts, and of dispelling the " ignorance and barbarism " which prevailed. (3)

At that time, the state of industry and of Society in the north was generally unsatisfactory. Con-

- (1) Brief History of the Society in Scotland for Propagating Christian Knowledge in the Highlands and Islands, by Henry Hunter, London, 1795, Page 18.
- (2) Summary Account of the Rise and Progress of the Society in Scotland for Propagating Christian Knowledge, Edinburgh, 1783, Page II.
- (3) Ibid, Page 12.

ditions were determined by factors partly dependent upon usage and custom, upon the heritage of the clan system, the temperament and natural inclinations of the Celtic mind, and partly upon the disadvantages of the system of land tenure. Land was occupied under varying conditions and the system of tenure affected the methods and progress of industry and was thus detrimental to the development of the social state.

Believing that the only remedy for this deplorable condition lay in an endeavour " to form the minds " of the rising generation, the newly formed Society for the Propagation of Christian Knowledge began a voluntary movement of education with the intention of disseminating knowledge concerning both religious and secular affairs. The First Charter was granted by Queen Anne in the year 1709, and within two years sufficient capital had been raised to warrant the appointment of the first schoolmaster. He was located at St. Kilda, where " nothing had been taught for many a dark and dreary generation, but the art of catching fish and solan geese, for the wretched support of mere animal

life." (I) By 1715, twenty five schools had been established in the north at which the reading of English, writing, Arithmetic, and Church Music were taught.

During the troublous times of the Fifteen Rebellion, when the objects of the Society were in grave danger of frustration, and in the years of unsettlement ensuing, the twenty five schoolmasters held tenaciously to their purpose, and it is perhaps remarkable that even in face of disappointment and immanent failure, the Society had the fortitude to increase the number of their schools. By the year 1732, one hundred and nine schoolmasters were at work, struggling against great difficulties, the aftermath of the late civil disturbance. The results of their labours were not eminently successful, and it soon became apparent that there was need for a new direction of method if the educational system was to achieve its purpose among the troubled clans. " A survey of the existing conditions in the schools and in rural communities where such were established revealed the fact that the social state could only

(I) Brief History of the Society, (Hunter), Page 21.
 MSS Petition from the widow of Alex. Buchan,
 Schoolmaster, St. Kilda, -- Laing MSS. Div. 2,
 No. 488.

be improved by training the young to habits of industry, of application, and of resource, and that the accomplishment of this ideal was dependent upon some method of relating education to immediate environment. " (1)

With the realisation of this ideal in view, an appeal was made to the Crown for enlargement of powers, and as a result the Second Letters Patent was granted in the year 1738. This new Charter permitted the erection of schools for the instruction of children in "some of the most necessary and useful arts of life" , (2) four essential occupations being chosen as the focus of the new development, Husbandry, Housewifery, Trades, and Manufactures. "Agriculture in its various branches, home crafts like spinning, weaving, and knitting, --- trades such as were necessary for all rural community life," (3) were selected as means for relating the school to environment.

The Society, however, experienced great difficulty in determining the mode of exercising their extended privilege. They advertised in the Edinburgh Press

(1) "Scottish Experiments in Rural Education during the 18th. Century", J. Mason, Scottish Educational Journal, June 7th. 1929, Vol. xii, No. 23, Page 654.

(2) Second Letters Patent.

(3) "Scottish Expers. in R.Ed. Page 654.

and requested Presbyteries to suggest methods whereby the designs of the new Charter might be made effective. (1) By November, 1739, few suggestions had been received, and the matter lay in ^aobeyance until 1742, partly because of diversity of opinion and partly owing to the lack of the necessary monetary support. (2)

Press notices may have been responsible for suggesting the first experiment, which owed its beginning to the enterprise and fortitude of a Schoolmaster. In the MSS Minute of General Meeting held on 1st. April, 1742, there appears a report concerning the memorial of a certain James Hamilton, Schoolmaster at Calder, who sought appointment in the Parish of Muthil. The Minute states;

" That a proposall lyes before the Committee to join labour with learning in the Charity Schools, for which end, That one Mr. Hamilton, now Schoolmaster at Calder, thoroughly acquainted with all the parts of ffarmary, having been for some years

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- (1) MSS Minute of S.S.P.C.K. General Meeting, 8th. March, 1739, and 4th. Jan. 1739.
 (2) MSS Minute of Socy. G.M. 1st. Nov. 1739, & 25th. Nov. 1741.

at that Trade in England, be appointed Charity Schoolmaster at Auchtermuthil in Parish of Muthil and Presbytery of Auchterarder, and that a gentleman Proprietor of Lands there, is to give him a House and a little farm gratis, where he may breed the Boyes at school to all the parts of Husbandry, That the Committee have resolved to settle Mr. Hamilton at Auchtermuthil, if upon enquiry he be found Qualified to be a Schoolmaster."

The proposal was agreed to with difficulty. The Society already had a Schoolmaster settled in the district, a certain John Robertson, who had served with credit and whose transference to another area was a matter of concern, and they hesitated to adopt a course which not only might bring injustice on a faithful servant, but which also might result in ruin to the system of education already established. In consequence, they sought the unbiassed opinions of certain agriculturalists of known reputation as to the feasibility of the proposed new experiment. (I)

We do not know if the agriculturalists sug-

(I) MSS Minute of Socy. G.M. 6th. Jan. 1743.

gested the provisions imposed on Hamilton, but we find that the Committee resolved three months later to accept the Dominie's proposal under the following conditions;

" That how soon he should show an Evidence of his having in Tack, or other settled way a ffarm Room in Parish of Muthil, or other Parish of that neighbourhood, he have from this Society Ten or Twelve Pound Sterling of Salary during the Society's pleasure to commence from the time of his Entry to such ffarm Room and after his beginning to Instruct any one or more of the Youth of the Country in the Art of Agriculture in manner proposed in the said Mr. Hamilton's memorial." (1)

On receipt of these conditions, Hamilton proceeded to the Parish of Muthil where he had promise of some boys as pupils, but he experienced difficulty in settling the Tack. (2) When information of this hitch in the arrangements reached the Society, they instructed their Committee of Schools and Missions to

(1) MSS Minute of Socy. G.M. 17th. March, 1743.

(2) MSS Minute of Socy. G.M. Ibid.

ascertain the exact number of the pupils in question, the recommendation upon which such were to be enrolled, and the proposed method of assuring that the Schoolmaster was executing his duties. (1)

By the Minute of General Meeting of June 2nd. 1743, Hamilton is mentioned as being in temporary residence at Stonchmanoch in the Parish of Callendar where he was contemplating the improvement of the land and the instruction of pupils in agriculture. The Tack, however, had not been completed owing to the temporary absence of the Proprietor, the Duke of Perth. By November, this Tack was produced --- " forty aikers of ground at Greenock & in Parish of Calandar for nineteen years from Whitsunday, of which there is already inclosed twenty five aikers with Ditch and Dyke". (2)

As it appeared that Hamilton was preparing to improve the land and intending to instruct a few pupils in Husbandry, the Society granted a salary of Twelve Pounds for the year. (3)

(1) MSS Minute of Socy. G.M. 17th. March, 1743.

(2) MSS Minute of Socy. G.M. 3rd. Nov. 1743.

(3) Ibid.

Those who sanctioned the experiment at Greenock were presumably unaware of the difficulties which confronted the audacious Dominie, and it is doubtful if Hamilton himself realised the full nature of the undertaking. The land was situated on a "Barren Muir", distant from the populace, (I) and its improvement was dependent not only upon experience and skill but also upon considerable monetary outlay. In such circumstances, it is reasonable to suppose that the farm was neither sufficiently productive nor so outstandingly attractive to allure scholars from the distant villages. The reports of the Minister of Calendar and of other Correspondents in the Parish of Dunblane may have unjustly measured the work of the pioneer Schoolmaster when they stated that Hamilton had proved an inefficient farmer and an unsuccessful Dominie. The labours of months of unproductive improvement held little prospect of effecting the progress of the surrounding communities. No pupils had been enrolled, nor was there expectation of any, and with this picture of failure before them, the

(I) MSS Minute of Socy. G.M. 22nd. March, 1744.

Society resolved to dismiss the Schoolmaster. (1)

Eight years elapsed before the second venture under the new Charter was launched, and possibly decision was influenced partly by the fact that the proposal was sponsored by the Right Honourable Lord Deskford, one of the Trustees of the Board of Manufactures, (2) and partly by the incidence of an increasing interest in the cultivation and manufacture of flax throughout Scotland. In 1750, the Board of Manufactures had agreed to utilise part of their funds in settling small colonies of linen manufacturers in different parts of the Highlands with the intention of weaning " the Inhabitants of these Countries from those Evil habits of Idleness and disaffection to the Government to which they have been so long accustomed", (3) and the stimulus thus given created a new development in rural industry in the north , and largely influenced the direction of practical education. Sums of money, varying from Seventy to Thirty Pounds , were granted by the Board to various Highland districts, (4)

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- (1) MSS Minute of Socy. 22nd. March, 1744.
C/f Scottish Experiments in Rural Education during the Eighteenth Century, J.Mason, Scott. Educ. Jour. Vol. xii, No. 23, June 7th. 1929, Page 654.
- (2) MSS Minutes of Board of Manufactures, 30th. June, 1749.
- (3) MSS Minute of B.M. 16th. Nov. 1750.
- (4) MSS Minute of B.M. 18th. Jan. 1751.

The enterprising attitude of the Trustees for the Board of Manufactures was reflected in ^{that of} the influential Highland Lairds, who, during the middle years of the century, encouraged the establishment of colonies by granting land on favourable terms at a time when strenuous efforts were being put forth to organise the linen industry throughout Scotland. In 1750, we find Lord Deskford interesting himself in the settling of manufactures in Banffshire. A Minute of the Board (I) gives a pleasing glimpse of the situation and of the practical results of resolution.

" A Tack, dated 11th & 13th. June, 1750, registered in the Books of Session this day, by the Lord Deskford To Thomas Ness son of John Ness Flax Raiser at Hospital Miln in ffife, of the Walk miln, Haugh of Boyne in the Parish of Boyndie and Shire of Banff for 38 years after Whitsunday 1750 was produced, And a Certificate from Mungo Rannie manufacturer at Cullen and William Dunbar Merchant in Portsoy, bearing that the Walls of

(I) MSS Minute of B.M. 21st. June, 1751.

(1) MSS Minute of Socy. - Genl Meeting. - 8th. Dec. 1750.
Also G.M. 8th. Jan. 1751, & MSS Min. of Board of
Manufactures, 18th. Jan. 1751.

Thomas Ness's Lint Miln were built, the Joists laid, the Roof on and slated, and above twenty Acres sown with flax seed this spring in the neighbourhood, was read."

It is of interest also to note that the Trustees agreed to remit £140 towards the cost of work accomplished.

When Lord Deskford presented his application to the S.S.P.C.K. advocating the establishment of a Charity School at Portsoy under terms of the Second Charter, there already existed in the Parish of Fordyce a little colony of a more or less self-subsistent nature. It had its flax raiser, its flax dresser, some good weavers, its spinning mistress, a "school for knitting stockings", some fishers and some gardeners. (1) These constituted the nucleus of a thriving community set amidst a people of backward conceptions concerning the industrial arts, along with some prosperous neighbours whose educational aims embraced a knowledge of Book-keeping and Navigation. Consequently, the petition sought to embody the

(1) MSS Minute of Socy. - Com. Meeting.- 8th. Dec. 1750.
Also G.M. 5th. Jan. 1751, & MSS Min. of Board of
Manufactures, 18th. Jan. 1751.

the claims of all sections of this mixed community, and we find Lord Deskford shrewdly proposing that the forenoon session should be devoted to English reading, writing, the common rules of Arithmetic, while in the afternoon the pupils should be sent to the spinning school, to the school for knitting stockings, or, as age and station permitted, to the craftsmen at the loom, to the fishermen, or to the gardener. (1) He advocated that children should not be admitted to the proposed school unless they were willing to participate in some branch of industry during the afternoon session, a proposal which favoured the application of his second suggestion, that "the Schoolmaster be allowed after he is satisfied that the other children are gone to work, to teach in the afternoon", the children of the more prosperous inhabitants "to write the other parts of Arithmetick, Bookkeeping, & Navigation, they paying him a small Gratification, quarterly, for encouraging the Design." (2) His Lordship undertook to build a good Schoolhouse without making any further demands.

(1) MSS Minute of Com. of Socy. 8th. Dec. 1750, & MSS Minute of G.M. 5th. Jan. 1751.

(2) Ibid.

The proposals appealed to the Society and a Grant of Ten Pounds per annum was awarded towards the provision of a Schoolmaster upon condition that he must be "loyal to the Government." (1)

During the time that deliberations were in progress concerning the proposed experiment at Portsoy, application was made by a certain John Anderson of Perth, who represented the interests of a company of merchants of that city, to have a school erected at Logierait. The application was influenced by the projected settlement of a "manufactory of Linnen cloth" at that place. The proposers discerned the necessity for incorporating in the work of the school a knowledge of spinning, winding of yarn, weaving, heckling, the growing of flax, and the culture of a garden. With the objects of the Second Charter and the pending experiment at Portsoy in view, the Society granted a sum of Three Pounds per annum towards the Schoolmaster's salary. (2), (3).

In 1752, a school was established in the

(1) MSS Minute of Com. of Socy. 8th. Dec. 1750, & MSS Minute of G.M. 5th. Jan. 1751.

(2) Ibid.

(3) The Board of Manufactures had granted Fifty Pounds on Nov. 16th. 1750 towards the introduction of heckling at Logierait-- MSS Min. of Board of Man. 18th. Jan. 1751.

Parish of Craig, near Montrose, with the intention of inducing boys to interest them selves in the land. The inception of this movement was due to local lairds and their tenants, who, with considerable foresight and enthusiasm, had formed themselves into a society for the purpose of supporting a school where agriculture and the art of gardening should form part of the curriculum. The petition presented at the hands of Robert Scott, Esq. of Duninald, at the beginning of the year, indicated the main purpose of the project, to educate the youth of the neighbourhood not only by means of the "usual knowledge", but also through industry, the proposed scheme of instruction embracing " the principles of Christianity & good Morals, The History of Great Britain, The Art of Husbandry & Agriculture, with the Rules thereof put in practice in the neighbouring ffarms; Also the Art of Gardening, Geometry & Land Measuring." The self-appointed society had purchased the necessary books on these subjects, together with a complete set of measuring instruments, and they expressed a willingness to furnish Twelve Poundseyearly to " one John Henderson a Person

well qualified for that Office, in order to encourage him to take charge of the new Undertaking. (1)

The Society granted Ten Pounds per annum on the understanding that the usual certificates were furnished by the Presbytery of the Bounds as to the efficiency of the Schoolmaster . (2)

It is unfortunate that details of the experiment have gone unchronicled. According to the published proceedings of the Society, (3) support was withdrawn by the Ist. November, 1755 because no statement had been received concerning the state of the school. The MSS. Minutes of the Society, however, fail to bear out this statement. In the Minute of Committee of Directors, dated

8th. November, 1752, it is stated that the Presbytery of Brechin submitted the opinion that the Charity School in the Parish of Craig was unnecessary because a Parochial school was already established " with a legal sallary " in the district. On receipt of this opinion, the Committee informed the Presbytery that the Charity School

(1) MSS Minute of Socy, G.M. 19th. March, 1752.

(2) Ibid.

(3) An Account of the Society in Scotland for Propagating Christian Knowledge, from its Commencement in 1709, Edinburgh, 1774, Chapter III, pages 20 & 21.

at Criag was not intended to serve the purposes of the Parochial School, but was established to promote the teaching of agriculture and manufactures. It was not until 1756 that the Society threatened to withdraw their support from the venture, on the grounds that, although the school had been operating from 1752, no account had been furnished regarding the progress of the experiment. Uncertainty as to the nature of the education given and as to its efficacy as a socialising influence constrained the Society to request from Scott of Duninald particulars regarding school enrolments, progress, and the general work of the school, the report to be attested by the Magistrates of Montrose. (1) Scott failed to furnish the necessary information, and the Society's support was withdrawn by March, 1756. (2) There is every reason to suppose that the experiment proved a failure. Even Scott appears to have recognised the unsuccess of Henderson to influence the community in the rural arts, for in his letter to the Society, dated 6th. April, 1756, he signified his approval to the action of withdrawal. (3)

(1) MSS Minute of Com. of Socy. 25th. Jan. 1756.

(2) MSS Minute of Com. of Socy. 3rd. March, 1756 & of G. M. 4th. March, 1756.

(3) MSS Minute of Com. of Socy. 19th. April, 1756.

In 1754, the Board of Manufactures had agreed to establish a colony for the manufacture of linen on the lands of McKenzie at Lochcarron. (1) The report of the survey stated that the proposed site lay "at the bottom of a bay which cuts twelve miles into the land, altogether navigable & safe for anchoring ships in, That at the head of the Bay is a large Tract of plain Ground to the extent of 200 acres & upwards, mostly heath or Coarse Grass but very capable of Improvement and abounding with plenty of good moss for firing." (2) The Trustees for the Board agreed to allow a grant for building "a proper factory for the principal undertaker", a certain Ninian Jeffrey, Stampmaster of Kelso, whom they appointed to oversee and conduct the operations of the colony. (3). By July, 1755 Jeffrey had incurred expense for building to the amount of £ 395, the total cost of the erections being fixed at £ 800. (4) The Trustees also proposed the appointment of a heckler, a flax raiser, a wheel wright, and a Spinning Mistress, "all from Kelso". (5) The Laird of Lochcarron agreed to grant twelve acres of land gratis for building

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- (1) MSS Minute of B.M. --Linen Com.-- 18th. July, 1754.
 - (2) MSS Minute of Com. of Socy. 6th. Feb. 1755.
 - (3) MSS Minute of B.M. 27th. Nov. 1754.
 - (4) MSS Minute of B.M. 4th. July, 1755.
 - (5) MSS Minute of Com. of Socy. 6th. Feb. 1755.

sites and gardens. (1) He proposed that the houses should be laid out in the form of a regular village, and he offered " the use of mosses and every other materiall the place" could afford for the purposes of building. He also agreed to provide " Grass at the ordinary prices of the Country for what cows and Horses the manufactories" might require, and he promised to " prevent extortion by the natives from the manufactorers" and to secure the possession of their effects. (2)

From the reported deliberations of the Linen Committee and the findings of the Trustees for the Board of Manufactures during the year 1754, it is possible to catch a glimpse of the manufacturing settlements at Lochcarron and other stations as they existed during the period. The reconstructed view of these outposts in all their simplicity of enterprise provides material of vital importance to the social and educational history of Scotland. The manufacturing village, situated as near as possible to the Kirk, (3) covered an area of from ten to twelve acres of ground. (4) This was parcelled out into

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- (1) MSS Minute of Com. of Socy. 5th. March, 1755.
 - (2) MSS Minute of Com. of Socy. 6th. Feb. 1755.
 - (3) MSS Minute of B.M.- Linen Com.- 16th. July, 1754.
 - (4) MSS Minute of B.M. 2nd. August, 1754.

building sites and into gardens, each half an acre in extent, to serve the domestic purposes of a family. (1) In the middle of the village stood the house and store of the principal undertaker, a building of two " stories and a garret", erected in stone and lime, with " roof of Easdale slate and of such size to store Lintseed, flax and other stores. " (2) It boasted of a length of forty eight feet and a breadth of eighteen or nineteen feet, and it provided a room for undressed flax on the ground level " with a timber floor entering a step up from the ground to keep it in condition." In the upper storey were two rooms, one for dressed flax and one for yarn.(3) The outer buildings of the village were less pretentious. In 1754, we learn of a proposal by the Linen Committee that these should be built of " wattling, posts interwoven with hazeland covered with turf," (4) but we infer that such a suggestion could only have been acted upon in the case of temporary erections. Considerations of regulation, the conditions imposed at later date upon the establishment of a colony , lead us to this con-

(1) MSS Minute of B.M. 19th. July, 1754.

(2) MSS Minute of Linen Com. 9th. July, 1754, & of B.M. 19th. July, 1754.

(3) MSS Minute of B.M. - Linen Com. - 11th. July, 1754.

(4) MSS Minute of Linen Com. 16th. July, 1754.

clution. We find it enacted that the " Possessors of the several Houses in the village shall have a Servitude of ffail & Divot and ffearns & Heather out of the adjacent muirs & also power to dig Stones Clay Sand and other materials for building." (1)

On the outskirts or in the offing of the village lay the twelve acres of the flax-raiser, a stretch of arable land suitable for the growing of lint, This ground was tilled and harrowed by the proprietor, who also undertook to lead the flax harvest home " at the ordinary rates." (2)

The inhabitants were emigrants from the southern counties, qualified craftsmen of certified loyal intentions to the Government. (3) There was the all-important principal undertaker, whose duties included the provision of flax to the weavers, and the supplying of all necessities for the support of the colony. He had the oversight of all operations, was responsible for the full employment of the people, purchased the lint grown in the cottage gardens, kept accounts, journalised his

(1) MSS Minute of B.M. 2nd. August, 1754.

(2) Ibid.

(3) MSS Minute of B.M.- Linen Com.- 21st. Nov. 1754.

doings, and sent report in abstract to the Board once in the year. The workers under his supervision included the master flax-raiser, the master heckler, the wheelwright-- maker of spinning wheels--, the blacksmith, and the spinning mistress. (I)

The whole industry was protected by the provisions of establishment. The lairds upon whose lands the colony was settled bound themselves to safeguard the interests of the emigrants. The proposals of the Board of Manufactures with respect to the safeguarding of the industry were comprehensive enough to cover the needs of the community. They were peculiarly applicable to the Highland outposts of industry.

" That the Proprietor shall Provide Summer Grass at the ordinary rates of the country, for what cows the manufacturers shall require, not exceeding 4 for the principal undertaker, two for the Possessor of each house built of stone and Lime, and one for the Possessor of each house of other material; and the Proprietor shall likewise make Provision for assisting the manufacturer to winter his cattle; and for this purpose he is to have on hand during the winter double the quantity for each of the manufacturers

(I) MSS Minute of B.M.-- Linen Com. 21st. Nov. 1754.

Cows of what is now ordinarily allowed for winter
 forage for the Cows of the Country, but the manufact-
 urer is only to Pay for what he consumes at the Current
 price of the Country for the time."

" That the manufacturers are to have moss-leave gratis for
 the first three years and thereafter to Pay as shall be
 determined by neutrall persons or by the Trustees."

" That the Proprietors of the Ground shall build a
 decent change house in the village for the accommoda-
 tion of strangers."

" That if any cattle horse or sheep belonging to the
 manufacturers be stolen and the thief unfound, the Pro-
 prietor shall make good the loss."

" That the Proprietor shall do his best to see that the
 manufacturers are civilly treated by the natives and
 accommodated in all the necessaries of life at the or-
 dinary rates of the Country." (I)

The Board of Manufactures made no provision
 for a school in the village. It was outwith their powers
 to furnish funds for the establishment of a schoolmaster,
 but their interest in the welfare of the community at

(I) MSS of Minute of B.M. 2nd. August, 1754.

Lochcarron prompted them to suggest to McKenzie, the Proprietor of the lands, that application be made to the S.S. P.C.K. for the setting up of a school in the midst of the new colony. In his memorial to the Society, McKenzie stated that the inhabitants of the district were well disposed towards the manufacturers, and were alert to the need for a schoolmaster to "instruct their children in writing and Arithmetick". (1) Although realising that the labours of the Dominie already established had effected a change in social attitude, he was sufficiently astute to recognise the importance of a self-subsistent community. The need for skilled craftsmen to produce the necessities for furthering industry and the social state among a people apparently ripe for progress suggested the idea of training boys to the craftsman's art. He proposed the employment of tradesmen as teachers of the industrial crafts, and the Society, considering that the scheme would contribute to the promotion of "Religion, virtue, and Industry in the Highlands," agreed to experiment along definite lines. (2)

They resolved to transfer the existing schoolmaster and replace him by a properly qualified teacher

(1) MSS Minute of Com. of Socy. 6th. February, 1755.

(2) MSS Minute of Socy. G.M. 5th. March, 1755.

from the south at a salary of Fifteen Pounds with a grant of Five Pounds for removal expenses. This concession made under the provisions of the First Charter was supplemented by the appointment of four tradesmen under the Second Charter,----- a blacksmith, a cartwright, a shoemaker, each at a salary of Ten Pounds , and a ploughman at a salary of Fifteen, all for a period of five years. The conditions of appointment were these;

1. Certificates as to moral character and allegiance to the Government were to be submitted.
2. The craftsmen were to be subject to the Society's rules for appointment of schoolmasters, but a certificate from the Society's corresponding member was to be accepted in lieu of the usual Presbyterial certificate.
3. " The ploughman shall instruct, gratis, as many as shall offer, and that the other three Tradesmen shall Enact themselves to Instruct such apprentices gratis as the Society shall think proper to Recommend, not exceeding the number of five apprentices each at a time." (I)

(I) MSS Minutes of Socy. G.M. 5th. March, 1755.

The apprentices were entitled to "Entertainment in the master's house" only under sanction of the Society, Five Pounds per annum being allowed for "entertaining and lodging" each house apprentice. (1) To the Parish Minister and the Laird was deputed the duty of nominating suitable board apprentices, and to ensure favourable conditions to the experiment, McKenzie was pledged to build houses for the schoolmaster and the tradesmen. (2)

A comparative survey of the Minutes of the Board of Manufactures and of the Society reveals the fact that the craftsmen appointed to Lochcarron by the Linen Committee were not accepted as the Society's teachers of crafts. This conclusion is based upon comparison of establishments. In the MSS Minutes of the Board of Manufactures dated 27th. December, 1754 and 7th. February, 1755, we find that, on the recommendation of Jeffrey, the principal undertaker, the following were appointed to the manufacturing village under superintendence of the Linen Committee;-- Murdoch McKenzie, Master flax raiser, William Keith, heckler, Janet Cunningham, Spinning Mist-

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- (1) MSS Minute of Socy. G.M. 5th. March, 1755.
 (2) Ibid. Also, MSS Minutes of Socy. - Com. Meeting, 2nd. April, 1755.

sign that their relations with the manufacturing colony
 res, and William Cunningham, wheelwright. These trades-
 were entirely prescribed by the Society. Moreover, one
 folk were mentioned by McKenzie in his petition to the
 of the conditions imposed upon McKenzie by the Society
 Society, (1) and there is no evidence in the Minutes of
 when they agreed to the establishment of craftsmen under
 the Board of Manufactures to show that others were ap-
 the Second Patent was that the Spinning Mistress employ-
 pointed in their stead or that additions were made to
 ed by the Board of Trustees should be bound to instruct
 the number before the year 1756.

In the MSS Minutes of Directors of the
 ing, and that McKenzie should "obtain from her an Enact-
 Society at date 23rd. April, 1755, there appears a list
 ment or Declaration to this purpose". (1) This is the
 of appointments approved by the General Meeting. This
 only recorded instance of the employment by the Society
 includes the following names;-- William Shillinglaw,
 of the Board's craftsmen.
 Schoolmaster; William Mason, Blacksmith; William ffoord,
 By March, 1756, (2) no report had been
 Cartwright; Alexander fforsayth, Ploughman; and George
 furnished regarding the progress made by the apprentices.
 Simson, Shoemaker. These were granted commissions to
 and it was only after Jeffrey, the corresponding secretary,
 teach their several subjects under the conditions of
 had been communicated with that details of the
 appointment as teachers, and it would appear that their
 were made known. In his letter, dated 1st. March 1756,
 establishment in the manufacturing settlement was in-
 he reveals a little concerning the work of the
 dependent of that of the Board of Manufactures. The
 Master and of the mechanics. (3) He states that the
 provisions of appointment allowed them to ply their
 blacksmith and the cartwright each had a
 trades for personal gain to supplement the teaching grant,
 awaiting indenture. The apprentices were
 and the scanty record of their operations together with
 business, but for the fact that on their ultimate dismissal by the Society
 they
 they migrated south appear to make certain the conclu-

(1) MSS Minute of Dir. of Socy. 23rd. April 1755.
 (2) MSS Minute of Dir. of Socy. 1st. March 1756.
 (3) MSS Minute of Dir. of Socy. 1st. March 1756.

sion that their relations with the manufacturing colony were entirely prescribed by the Society. Moreover, one of the conditions imposed upon McKenzie by the Society when they agreed to the establishment of craftsmen under the Second Patent was that the Spinning Mistress employed by the Board of Trustees should be bound to instruct all the girls of the Charity School in the art of spinning, and that McKenzie should "obtain from her an Enactment or Declaration to this purpose". (1) This is the only recorded instance of the employment by the Society of the Board's craftsfolk.

By March, 1756, (2) no report had been furnished regarding the progress made by the experiment, and it was only after Jeffrey, the corresponding member, had been communicated with that details of the venture were made known. In his letter, dated 16th. March, 1756, he reveals a little concerning the work of the Schoolmaster and of the mechanics. (3) He stated that the blacksmith and the cartwright each had an apprentice awaiting indenture, "that the shoemaker has very good Business, but for the want of proper accommodation he

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- (1) MSS. Minute of Socy. G.M. 5th. March, 1755.
 - (2) MSS Minute of Dir. of Socy. 3rd. March, 1756.
 - (3) MSS Minute of Dir. of Socy. 1st. April, 1756, and of G.M. 3rd. June, 1756.

which he is soon to provide himself with, he has not got any offered as apprentice, that the ploughman has prepared Ground for oats and Barley, that he has already planted three Bolls of potatoes with the plough, but he has yet got no offerr of an apprentice, That the schoolmaster has at present Twenty Boys and Girls, and that soon he will have double the number by reason they see they make greater progress with him, than with any schoolmaster in the Country."

Nothing further was reported until March, 1759, when Jeffrey applied for permission to indenture a new apprentice to the blacksmith . At this juncture, the Society considered the whole position regarding the mechanics at Lochcarron in view of the fact that the contract made with McKenzie was due to expire in May, 1760. From further reports demanded from Jeffrey, it was evident that the experiment had proved unsuccessful. The ploughman had failed to attract apprentices; the spinning mistress had only taught three girls; the other tradesmen had indentured only two apprentices, and " one of these two deserted". (1) McKenzie also had failed to employ the gardener promised. His interest in the experi-

(1) MSS Minute of Dir. of Socy. October 10th. 1759.

ment had apparently waned for he sent no request that the craftsmen should be retained as teachers, and the Society agreed to dismiss the mechanics by May 1st. 1760. (1) But the craftsmen were not easily disposed of. Championed by Jeffrey and by the Minister and Kirk Session of Lochcarron they sought to be continued on the score of hardship, but the Society's decision formerly agreed upon was adhered to, and the mechanics gradually migrated south. (2) By July, 1760, all of them had departed except Simson, the shoemaker, who pleading hardship due to the loss of a shipment of leather and to bad business, was unable to face removal expenses, and was granted a sum of Eight Pounds for transportation of his goods to the Borders. (3)

Although the venture at Lochcarron had failed to attract the young Highlander, the influence of the mechanics among the people generally was effective. Knowledge of the peculiar crafts and methods of the tradesmen could scarcely be unknown to the inhabitants of the district, when for five years the mechanics worked in sight of curiosity and of open criticism. Perhaps, the progressiveness and zeal in industry may be detected

(1) MSS Minute of Dir. of Socy. 10th. Nov. 1759 & G.M. 15th. November, 1759.

(2) MSS Minute of Dir. of Socy. 3rd. April, 1760.

(3) MSS Minute of Dir. of Socy. 3rd. July, 1760.

from two episodes narrated in the MSS Minutes of Society. We know that Simson had a brisk business in the making of shoes, and that he imported his leather from Leith. We should never have known the fact if the ship "Success" had not been lost at sea on her way to Inverness carrying a quantity of leather consigned to the shoemaker at Lochcarron, and valued at £11-4-3. The loss of his raw materials involved Simson in considerable hardship and the members of the Society were compelled to contribute towards retrieving the loss. (1)

We know also that the ploughman made progress in improving the land. His success as a practical farmer constrained several people to visit his holding to watch his methods. (2)

These slight touches upon social life show the trend of progress among a difficult people at a period when expansion could hardly be looked for, and when the spread of knowledge, of lowland ideas and customs, was necessarily slow. Perhaps these lights upon social conditions may help to gloss the failure of the Society's experiment.

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- (1) MSS Minute of Dir. of Socy. 7th. June, 1757.
 (2) MSS Minute of Dir. of Socy. 3rd. June, 1756.

(1) MSS Minute of Dir. of Socy. 20th. March, 1755 & 8th. June, 1756

The system of apprenticeship begun at Lochcarron was also attempted at Glenmoriston in the year 1755 through the instrumentality of Alexander Schaw, Principal undertaker for the linen manufacturing community at that station. His petition to the Society illumines the pages of social history, throwing light upon prevailing conditions in that corner of the far Highlands. Schaw, on his own showing, had been instructed by the Board of Manufactures to survey the district and report upon the nature and situation of the soil and its suitability for the growing of flax and hemp. He had recommended a location for the establishment of a village, and the Board had acquiesced in the proposal. The land surveyed extended from ten to twelve miles north and south and from two to four miles Scots east and west. The situation of the proposed village was "concentrical", lying twenty Scots miles west of Inverness in the bosom of an "inland Glen" far removed from the main highway, little frequented. In this district small trade was done and very few tradesmen at work. He estimated the existing population at one thousand, of which "not forty can read and saving the Laird and his family none can write". (I)

(I) MSS Minute of Dir. of Socy. 20th. March, 1755 & G.M. 5th. June, 1755.

The observations which Schaw made upon social conditions are discursive and illuminating. He was shocked to observe the "great Ignorance and Irreligion of the inhabitants". "They know no more than by hearsay that there is a God", he wrote. "Were they to be asked anything further they would be found to be as ignorant as the wild americans and any of them that profess religion are gross papists and it can hardly be otherways as they are deprived of the means of knowledge and Education having no schools among them no minister to instruct them nor publick worship and being thus neglected The Popish priests who are indefatigable in making Proselytes corrupt the minds and moralls of the people and Instill into them Rebellious principles destructive to our happy Constitution & Revolution principles." (1)

"They were much addicted to Thieving untill of late that they are kept all under by the wise and prudent conduct of the Legislature. They were all to a man engaged in the Rebellion of 1715 and 1745 and this owing to the craft subtilty of the Popish Missionaries." (2)

(1) MSS Minute of Dir. of Socy. 20th. March, 1755, & G.M. 5th. June, 1755.

(2) Ibid.

Such a picture of social conditions impressed the members of the Society. They perceived possibilities for social improvement in the scheme proposed by Schaw, who reckoned that by the appointment of a schoolmaster, a smith, a shoemaker, a tailor, a cartwright, and a farmer, such a state of depravity could be remedied. By affording the "means of knowledge" and granting facilities for the teaching of crafts, the Society would provide an effectual means of civilising the inhabitants. The old would be reformed and the young reared on Protestant principles. Both would be wrested from idle customs and become good Christians and industrious subjects.(1) The funds available under the Second Charter were insufficient to allow of the whole project being attempted, however, and the Society only granted Fifteen Pounds towards the establishment of a Schoolmaster, and Ten Pounds towards the appointment of one mechanic, the latter being expected to instruct five apprentices nominated by the Society at Board Wages of Two Pounds Ten Shillings each.(2) At the request of Lord Deskford, the grant was augmented to Seven Pounds Ten Shillings for each of a blacksmith

(1) MSS Minutes of Dir. of Socy. 20th. March, 1755, & of G.M. 5th. June, 1755.

(2) Ibid.

and a gardener, " both persons to understand and speak English" and be subject to the rules applying to the mechanics employed at Lochcarron. (1)

In September, 1755, certificates were produced from the Magistrates and Ministers of the Burgh of Elgin, testifying to the moral character of two nominees, Alexander Simson, Gardener, and William Donaldson, Smith, both natives of the town. They were certified loyal men and were duly appointed. (2) Their efforts, however, were not entirely satisfactory. Although by June, 1756, an apprentice had been bound to each, -- youths of the name of Grant--- the position of affairs was worsted ^{en} before the end of a year. Schaw, as official correspondent, gives us a glimpse of how matters stood, and incidentally touches upon social affairs, in his report submitted on the 28th. of April, 1757. He related that John McAlpine, the Schoolmaster, had fifty five scholars, badly in need of books. The Gardener and the Smith, he reported, were very necessary, " but that by the Extraordinary levie lately made in the Country both their apprentices were prevailed upon to Inlist upon the Twenty

(1) MSS Minutes of Dir. of Socy. 16th. June, 1755 & of G.M. 6th. November, 1755.

(2) MSS Minute of Dir. of Socy. 1st. September, 1755.

first day of March last, That to make up the loss, he upon the fourteenth current entered John McDonald as an apprentice to the Smith, and Malcolm Cameron as apprentice to the Gardiner, in hopes the Society will approve". (1)

Nothing further relating to the experiment is contained in the Minutes until February of 1762, when Schaw was reported as complaining about the Society's withdrawal of support to the mechanics, " particularly that he was informed the smith was removed in order to make way for his apprentice who the petitioner says cannot be qualified being only three years an apprentice and gave very little application , (2) and also because it was impossible for the craftsmen to remove south in the dead of winter. Although the Committee of Directors agreed to delay consideration of the matter till after receipt of a report upon the visitation of the school, (3) no record appears to be extant concerning the report or relating to the experiment whatsoever, and we may suppose that the former decision to withdraw the grant was ratified.

By 1756, manifestations of the expansion of interest in the movement so courageously begun by the Society were noticeable as far north as the lone Shetland Isles. With an appreciation of the value of improved meth-

(1) MSS Minutes of Dir. of Socy. 13th. May, 1757.

(2) MSS Minutes of Dir. of Socy. 4th. February, 1762

(3) Ibid

for the first three years Rent Free. (1)
 ods of cultivation to the inhabitants, Sir Andrew Mitchell
 The Society allowed a sum of Five Pounds for
 of Westshore presented a petition to the Society "bearing
 seven years towards the employment of a skilled ploughman.
 that the Islands of Zetland tho large in extent of Ground
 whose income was to be supplemented by Sir Andrew Mit-
 and containing about sixteen or Seventeen Thousand In-
 habitants, are very Barren and unfruitfull, seldom
 and ten acres of improvable land allotted. The plough-
 yielding as much corn as will afford Bread to the Inhab-
 itants for eight months, and sometimes not for six
 months in the year, That a Great deal of the Ground tho
 at present Barren, is of a soil capable of being brought
 in and cultivated into good arable and Grass Ground, and
 that what is already arrable may be greatly Improved by
 people skilled in the Knowledge of Agriculture, whereof
 the Inhabitants are Entirely Ignorant, and proposing that
 the Society would for some competent annual allowance
 for a certain number of years, to one or two ploughmen
 well skilled in Agriculture, and Improving of Barren
 Ground, who may be prevailed on to repair & settle in
 Zetland under such Regulations as the Society shall
 think fitt to appoint, and if such person is fixed on
 any part of the petitioner's Estate in that Country, he
 will at his own Expence, for the Encouragement of such
 person cause Erect a convenient house for him, and give
 him some acres of Ground contiguous thereto to Improve,

for the first three year^s Rent Free". (I)

The Society allowed a sum of Five Pounds for seven years towards the employment of a skilled ploughman whose income was to be supplemented by Sir Andrew Mitchell, and for whom a house was to be built and a garden and ten acres of improvable land allotted. The ploughman was under obligation to instruct all whom the Society and Sir Andrew recommended. As a further encouragement to the promotion of the agricultural industry in Shetland, the Society agreed to settle five youths recommended by Sir Andrew Mitchell as apprentices to farmers in the lowlands, the ages of the youths to be sixteen years or over, certificates of moral character being furnished by the Minister and Kirk Session of the Parish of domicile. A sum of Ten Pounds per annum, "being fourty shillings to each young man", was allotted for a term of nine years on condition that each apprentice should receive instruction for a period of no longer than three years, and that at the expiry of the period of apprenticeship Sir Andrew Mitchell should contract to make provision for the employment of the youths in the Islands of Shet-

(I) MSS Minutes of Dir. of Socy. 25th. January, 1756, & also of G.M. 4th. March 1756.

(1) MSS Minute of Dir. of Socy. 25th. January, 1756.
(2) MSS Minutes of Dir. of Socy. 4th. March 1756.

land, under penalty of repayment of the sums expended. (1)

Although the scheme as outlined was approved, there is no indication in the Minutes to warrant conclusion that the experiment was ever undertaken. If it was attempted, there is no Minuted record of its development. Perhaps, however, this lack of information may be partly compensated by the fact that the trend of opinion regarding the nature of the developments in agricultural education was veering towards a new and a distinctive end. It may be that the scheme as agreed upon for the improvement of the Shetland Isles,-- the system of drafting apprentices to lowland farms--- proved to be the influence which determined the efforts of the Society in later years.

In March, 1760, The Trustees of the Board of Manufactures had made arrangements with a certain Duncan Grant, a Linen Manufacturer of Forres, for the establishment of a lint mill and an industry to serve the districts of Forres, Badenoch, and Strathspey. Grant had contracted to carry on the growing of flax, the spinning of yarn, and the weaving of linen cloth, under encouragement of the Board, which yearly distributed about sixty pounds worth of lint seed. (2)

(1) MSS Minute of Dir. of Socy. 3rd. March, 1756.

(2) MSS Minutes of Dir. of Socy. 20th. March, 1760.

In order to provide for the future development of the colony, Grant approached the Society with the proposal that six lads from the Highlands should be apprenticed to him for a period of six or seven years. He craved that the Society grant a sum of Ten Pounds towards the fee- charges of each apprentice and allow an additional amount of Thirty Three Pounds as a premium to be divided among the most deserving youths at the termination of apprenticeship. (1) Attestation as to the moral character of Petitioner, together with certificates and recommendations were issued by Justices of the Peace, by four Ministers in the Presbytery of Forres, by the Kirk Session of Cullen, and by Lord Deskford. Recognising the usefulness of the proposed scheme and the suitability of Grant as instructor, The Society considered the project with favour, but the proposal ultimately became merged in the larger consideration issuing from the receipt of the Woods' Legacy. (2) This was a sum of Two Thousand Pounds bequeathed by Seymour Woods of London. Intimation of the bequest had been received by the Society in 1758. (3)

The Capital was to be immediately and wholly utilised

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- (1) MSS Minute of Dir. of Socy. 20th. March, 1760.
 (2) MSS Minutes of Dir. of Socy. 1st. May, & 5th. Nov. 1760
 (3) MSS Minutes of Dir. of Socy. 1st. May, 1759, & of G.M. 16th. November, 1758, and 4th. January, 1759.

(2) MSS Minute of Socy. 11th. December, 1762.

for the purposes of the Second Charter, a provision which presented great difficulty to the Society.

It is interesting to trace the progress of the deliberations and proposals of the Committee of Directors with respect to the bequest as they shed light upon contemporary social affairs in Scotland generally, and reveal the trend of educational opinion along the lines of industrial training. In their anxiety to find a method of disbursement adequate and appropriate to the wish of the donor, the Society advertised in "the three Edinburgh Newspapers" inviting proposals from manufacturers as to the best means of utilising the legacy. The advertisement created misapprehension in the minds of the public. It was thought that the intention of the Society was to give assistance to struggling tradesmen, whereas the total sum was donated to promote "the interest of Manuffactories & Trades particularly in the Northern Counties". (1)

The proposals ultimately received formed the basis of a tentative scheme submitted to the General Meeting at the close of the year 1762, (2) but it is of moment to note that in the Committee's suggestions the

(1) MSS Minute of Dir. of Socy. 3rd. Oct. & 8th. Oct. 1760.

(2) MSS Minute of Socy.-- G.M. 21st. December, 1762.

ently in its infancy in Scotland, and the Committee, interests of the Highlands were partly obscured by perceiving possible advantage to the textile industries, those of the lowlands. Nevertheless, the proposals revealed signs of industrial progress throughout the enlightened south.

Among the decadent industries there were mentioned the making of parchment and vellum, -- "now very nearly lost in Scotland, there being at present but two or three persons at most who exercise that trade" -- (1) and the encourage certain struggling trades, some only in their infancy, and others in a state of stagnation. Among the former were included the lately introduced manufacture of blankets "in the English manner", an industry encouraged by the Edinburgh Society. The success of this venture had been impeded because of the inability of the Scots tradesman to spin yarn in the proper manner. A similar disadvantage militated against the progress of the manufacture of Fustians through lack of the necessary cotton yarn. In the case of both industries, the Committee of Directors of the Society proposed to award premiums to encourage the art of spinning after the new method. (1)

The industry in dyeing, closely allied to these manufactures, was in the position of being out of date. The dyeing of worsted upon modern methods was appar-

(1) MSS Minute of Socy. G.M. 21st. December, 1762.

ently in its infancy in Scotland, and the Committee, perceiving possible advantage to the textile industries, agreed to the necessity of binding apprentices to the new art.

Among the decadent industries there were mentioned the making of parchment and vellum,--- " now very near lost in Scotland, there being at present but two or three persons at most who exercise that trade"-- (I) and the cutler's art practised by few in the country, although " Scythes, Knives, Forks and other Instruments " were in great demand. For the survival of such industries it was proposed to indenture a few apprentices.

In the suggested scheme certain considerations appear which are peculiarly representative of the period. We find the suggestion made, for instance, that the manufacture of Norwich Flannel, " used as Dead Clothes", and of which the "consumpt" was very great, should be introduced; that a premium should be awarded for the making of " stock tape & Girth webs"; and that as " many of the Goat & Kidd skins in the Highlands" were rendered unfit for use " by their being unskilfully dried", it would be to advantage to settle skilled tanners in the

(I) MSS Minutes of Socy. G.M. 21st. December, 1762.

(I) MSS Minutes of Socy. G.M. 21st. December, 1762.

small towns adjacent to the districts where the skins were produced. To serve this latter purpose it was proposed that two apprentices be appointed for instruction in the tanner's craft.

The more general application of the scheme to the Highlands touched the art of Husbandry. The advocacy of the culture of clover and "artificial Grass's for Hay" in view of the fact that in many parts of northern Scotland "numbers of cattle" died in winter for lack of fodder; the proposed premiums for the instruction of the people, in extension of this advocacy, so that the hay supply might be adequate and the system of cropping varied to the better advantage of the agricultural industry; the encouragement proposed for those who would undertake the growing of madder; and, as the bequest had particular reference to the Highlands, the suggested policy of instructing apprentices from the north in the art of raising clover, grasses, and madder, indicate the methods by which it was hoped not only to observe the stated wishes of the Donor, but also to influence the social state in the far north. (I)

Such a scheme, varied in its outlook and in its application, commended itself in such degree to the

(I) MSS Minutes of Socy. G.M. 21st. December, 1762.

General Meeting of Society that it was resolved to seek the advice of farmers, tradesmen, and manufacturers regarding the suitability of the proposals. (1)

As a result, we find that on the 11th. January, 1763, the Committee of Directors agreed that encouragement by premium could only be allowed to trades for "the instructing & Breeding up Children in Husbandry & Housewifery or Trades & Manufacture" (2)

The new proposals embodied the following;

- I." That One Thousand Pounds be given to any Proper Persons who shall undertake to Erect schools not under the number of Five for a certain term of years, for the Purpose of the Second Patent and under direction of the Society, that three of these should be kept in Edinburgh, that the 4th. be in the north Highlands & the 5th. in the West Highlands. That a school in the north Highlands be erected at Inverness & that part of Raining School be taken for the purpose. Also that £150 stg. be taken for buying Wheels & Reels to be distributed by way of Premiums

(1) MSS Minutes of Socy. G.M. 6th. January, 1763.
 (2) MSS Minutes of Dir. of Socy. 11th. January, 1763.

(1) MSS Minutes of Dir. of Socy. 11th. January, 1763.

amongst the scholars to be educated at above schools.

2. That one or more apprentices be bound to learn dyeing of cotton & wool.
3. That encouragement be given to making parchment, one or more apprentices being bound.
4. That encouragement be given to a smith, cart & plough wrights in the Highlands, one or more apprentices to be bound to these. " (I)

The swift progress made in deliberation upon the suggestions received by the Society is revealed by the fact that on February 3rd. 1763, the Committee of Directors unanimously agreed to propose to the General Meeting that Wood's Legacy should be wholly utilised in instructing Highland children either in Husbandry and Housewifery or in Trades and Manufactures, so that the social life of the Highlander might eventually be improved. A certain number of boys from ten to fourteen years of age, recommended by the Kirk Session of the Parish and by a Justice of the Peace, were to be taken from the Highlands to Edinburgh and boarded in the Orphan Hospital, remaining there until they showed proficiency in Reading, Writing, and Arithmetic, to

enable them to profit by an adequate apprenticeship to a trade. (I) The estimated cost of maintaining forty Highland boys in the Orphanage Hospital would be at the rate of Six Pounds Sterling per annum exclusive of clothing, with an additional Twenty Shillings per capitum for fitting up and furnishing beds. (2)

A certain number of boys also from the Highlands were to be bound as apprentices in towns in the north, and these, along with the apprentices in Edinburgh, were expected to return and settle at their trades in northern districts at the expiry of their period of indenture. (3)

A further proposal included the appointment of ten itinerant Spinning Mistresses who should travel throughout the Highlands teaching the spinner's art.

The accepted plan of expending the whole of the Woods' Legacy upon education in the Highlands according to the provisions of the Second Letters Patent found final and definite expression in the proposals submitted by the Committee of Directors to the General Meeting on the 3rd. of March, 1763. (4)

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- (1) MSS Minute of Dir. of Socy. 3rd. February, 1763.
 - (2) MSS Minute of Dir. of Socy. 22nd. February, 1763.
 - (3) MSS Minute of Dir. of Socy. 3rd. February, 1763.
 - (4) MSS Minute of Socy. G.M. 3rd. March, 1763.

These incorporated the following;

I. " That twenty itinerant schools be erected in the Highlands in which Spinning shall be taught at such stations and under such regulations as shall be settled by the Committee of Directors.

£1200 to be used for the purpose as follows;

Twenty Itinerant Spinning ^Mistresses at £15 for every 100 girls they shall teach, the number to be taught by each instructor not to exceed 100.-----£300.

That each girl when taught shall have a Wheel & Reel at 8/- 2000 at 8/-----£800.

For an overseer for settling schools & supervising the Spinning Mistresses £50 and £50 for transport of Wheels & Reels-----£100

£1200

2. "That Twenty Highland Boys 10-14 be bound as apprentices in the most central towns in the Highlands to trades they have an aptitude for-----

To apprentices fees, clothing & tools 20 at £20-----£400

3. That Twenty Highland Boys 10-14 be bound as

apprentices in the low country-- to return after apprenticeship-----

To bringing them from the Highlands 20 at £5-----£100

Clothing 20 at £5----- 100

Tools 20 at £10----- 200

£400" "(I)
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The application of this scheme touched the manufacturing industries more directly and with greater result than it affected such rural industries as were connected with land cultivation, those occupations which were inseparable from the development of rural social life of the time. We find a greater interest manifested in the development of spinning and a greater stimulus afforded to that craft by the instruction given by the itinerant Spinning Mistress, whose influence mostly reached the female population, than was evinced in the development of agriculture, its allied trades, and in those other occupations peculiarly belonging to the male members of the rural community. The slow development and seeming failure of the scheme of male apprenticeship were due to various factors relating to

(I) MSS Minute of Socy. G.M. 3rd. March, 1763.

(2) MSS Minute of Dir. of Socy. 22nd. August, 1763.

(4) MSS Minute of Dir. of Socy. 6th. Sept. 1763.

social conditions,--- the apathy or lukewarmness of many of the Highland Lairds and the Clergy, the selfishness of industrial enterprise, and the apparent listlessness of the rural populations.

We find that the Society was compelled to advertise , soliciting recommendation of Highland boys, (1) forced to seek converse with farmers regarding the "Breeding of boys" to agriculture, (2) obliged to ask Kirk Sessions to recommend twenty apprentices, (3) and to request the Provost of Glasgow in name of the Highland Society to nominate four or five suitable lads. (4)

The result of these efforts is revealed in the detailed record of indentures, and it clearly demonstrates that the experiments carried out in pursuance of the second provision of the scheme were by no means unsuccessful. By the end of the year 1763, twenty one boys had been indentured to trades in the Highlands, the indentures covering apprenticeships in occupations mostly connected with agriculture. This was one in excess of the number already agreed upon, and it is interesting to note that where the Highland Lairds were enthusiastic provision was made by

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- (1) MSS Minute of Dir. of Socy. 7th April, 1763.
 - (2) MSS Minutes of Dir. of Socy. 7th. July, 1763.
 - (3) MSS Minute of Dir. of Socy. 22nd. August, 1763.
 - (4) MSS Minute of Dir. of Socy. 6th. Sept. 1763.

them for the settlement of the apprentices whom they nominated, such provision including a house, a kailyard, and usually two acres of arable land rent free.

In pursuance of the policy contained in the third Article of the scheme, it was resolved to disburse the sum of Two Hundred Pounds in purchasing wheels and reels, in awarding premiums, and in instructing girls in spinning yarn and knitting stockings. (1) The remainder of the legacy was to be applied to the apprenticing of boys to farmers, blacksmiths(including horse shoers and farriers), to wheel, cart, plough, and mill wrights, to house carpenters and other useful tradesmen, such apprentices being indentured either in Scotland or in England. In the latter case, improvers only were to be recommended, those youths who having already served an apprenticeship, showed diligence and proficiency, so that they might benefit by experience of trade methods elsewhere and eventually return to the Highlands with increased knowledge and skill. (2)

The first recorded application under this latter arrangement appears in a letter received from a Mr. Riddle of Ardnamurchan, who proposed to send some of

(1) MSS Minutes of Dir. of Socy. 6th. March, 1769, & of G.M. 1st. June, 1769.

(2) Ibid.



his tenants, educated at the Society Schools, to Norfolk farms. (1) Two apprentices were thus nominated, each with an allowance of Twenty Guineas for board, clothing, and instruction, and this venture suggested to the Society the idea of communicating with several gentlemen, and of enclosing a copy of Riddle's letter with that of the Regulations of 6th. March, with the request that suitable nominees might be recommended. (2) To show the nature of the Society's endeavour to solicit influential co-operation, it is necessary to record the names of the persons approached. The record contains the following;-- The Duke of Gordon, the Duke of Atholl, the Marquis of Lorn, the Earls of Breadalbane, Findlater, and Fife, Col. McKay of Bighouse, Sir. Alexander McDonald, Sir. Laurence Dundas, the Laird of McLeod, and the young Laird of Grant. (3)

The record of apprenticeships appearing at intervals in the Minutes of Directors may be attributed largely to a few of these prominent proprietors of land. The record is by no means inspiring from the point of view of distribution, but it reveals at least the accepted need for the spread of practical education among the

(1) MSS Minutes of Dir. of Socy. 6th. March, 1769, & of G.M. of 1st. June, 1769.

(2) Ibid.

(3) Ibid.

backward clans. We find among the progressive land superiors a desire to improve social conditions in their immediate localities. The recommendations made were mostly confined to the agricultural industry and to occupations directly connected therewith. To show the nature of interest manifested in the scheme, we may submit the following record of nominations;

I. Nominations by the Duke of Argyll;

One apprentice cartwright and one apprentice blacksmith, both to be indentured in Glasgow. (1)

One apprentice blacksmith, to be indentured at Inverary. (2)

One apprentice weaver to be bound to John Bell of Inverary. (3)

2. Nominations by the Earl of Breadalbane;

One apprentice to John Fiddon, farmer in the County of Cumberland. (4)

3. Nominations by the Duke of Atholl;

One apprentice to a farmer in England, (County unrecorded). (5)

4. Nominations by the Earl of Findlater;

One apprentice ploughwright to be bound at Cullen, and one William Dingwall "to be bred with John Ferguson the King's Cooper at Aberdeen for the Cooper Trade, and in particular for that part of it, which

(1) MSS Minute of Dir. of Socy. 15th. July, 1771.

(2) MSS Minute of Dir. of Socy. 1st. March & 6th. Sept. 1781.

(3) MSS Minutes of Dir. of Socy. 2nd. June, 1785.

(4) MSS Minutes of Dir. of Socy. 8th. August, 1771.

(5) MSS Minutes of Dir. of Socy. 18th. June, 1772.

relates to the making of salmon Kitts & packing of salmon. " (1)

5. Nominations by Baillie Duncan Campbell of Inverary;

One apprentice mill, plough, and cart wright, one Peter McVean from Tuerachan in Breadalbane, bound to James Rutherford at Dalkeith for four and a half years. (2)

These, with one apprentice wright educated at Glasgow and two youths from Perthshire whose trades are unspecified; (3) two apprentices nominated by Robert Campbell of Inveraw, to be taught trades on his estate; (4) and three apprentice weavers whom Colin McKenzie, the Minister of Fodderty, had put to instruction at his own expense, and to whom was remitted payment of Nine Pounds Ten Shillings, (5) constitute the record of indentures appearing in the Minutes.

The actual influence of these experiments can never be fully realised without reference to the background of the social state as it existed in the Highlands of the period. In spite of the assertion that these ventures along the lines of practical education were ineffective, it may be said that the enterprise of the

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- (1) MSS Minutes of Dir. of Socy. 26th. July, 1769.
 - (2) MSS Minute of Dir. of Socy. 26th. June, 1780
 - (3) MSS Minute of Dir. of Socy. 5th. May, 1774.
 - (4) MSS Minute of Dir. of Socy. 1st. March, 1781.
 - (5) MSS Minute of Dir. of Socy. 7th. July, 1785.

Board of Manufactures and of the S.S.P.C.K. exerted an influence upon social conditions which gradually permeated the social system. The impetus afforded to industries intrinsically valuable to the development of the scattered rural communities, the system of instruction by means of skilled tradesmen and by the itinerant spinning mistresses, brought to the Highlands a new outlook upon life, upon individual and corporate endeavour, upon motive in industry, upon the usefulness of continued and progressive application at a time when the modes of life, the inherited and established customs of the northern people were prejudicial to progress.

In estimating the work of the promoters of industry in such rural communities still in a state of imperfect expansion, consideration must be given to all those factors which militated against progress and improvement. These touched the people themselves, and the economic conditions influenced largely by isolation through geographical position. The spread of ideas regarding industrial practice was hindered by the incidence of custom and traditional attitude. The promoters of industry were dealing with a people who piqued themselves upon their descent, who regarded all handicraft as servile, who for generations had been accustomed to

Proof
of
this
want

look upon the spinning of yarn as women's work, and who held tenaciously to custom and tradition in agricultural practice. The men of the clans depended upon the breeding and grazing of cattle for their livelihood. They had their winter houses along the sea coasts or in the sheltered glens. In springtime, they drove their cattle to the hills where they erected huts for their own accommodation. There they continued during the summer in a state of comparative indolence. When they were not engaged attending the cattle, they spent the hours basking in the sun " or else in the whisky house". (1)

They moved from place to place in search of fresh grass only when necessity compelled them, and they depended upon the women " to take care of the milk", to make the butter and cheese, and in leisure hours to spin " a little on the distaff for the use of the family". (2)

On the advent of the fall they returned to their winter shelters to feed upon beef, goat-flesh, and mutton, eked out with " a little meal made into water gruel or Brochan." (3) They made little provision for the wintering of the cattle. Wandering through the fields the beasts subsisted upon the stubble or grass unpastured during the summer months. This supply rapidly de-

(1), (2), (3), Laing MSS. Div. II. Folio 623.

(1), (2), (3), Laing MSS. Div. II. Folio 623.

creased, and little straw and no hay being available, the cattle either died or emerged at the return of spring in an emaciated condition, scarcely able to travel to the hills again. Their condition by the month of May, when the drovers arrived to purchase them, was poor and the chances of satisfactory sale were entirely wanting. Even if the Board of Manufactures had done nothing more than suggest remedial measures in such case, as they did by pointing to the necessity for enclosing the fields, the sowing of grass for hay, and the erection of shelters or "shades" with hecks for feeding, (1) they would have bestowed incalculable benefit upon the Highlands.

Traditional methods also affected the cultivation of arable land. The fields were "dunged with the cattle lying" upon them. (2) In some districts it was customary to strew the ground with leafy branches cut from the trees, these being left until the leaves fell and decayed. Ploughing was delayed until springtime, "a short time before the corns are sown". (3) The plough used was imperfect so that the soil was badly laid open. Generally, the advantages accruing from "changing the

(1), (2), (3), Laing MSS. Div. II. Folio 623.

seed of their corn", the rotation of crops, were entirely unknown. (I)

The nomadic mode of life militated against a settled state of industry, and whatever was attempted by the Board of Manufactures to promote stability where unstable conditions prevailed, to create centres of influence for the improvement of community life, where custom and tradition were so strongly rooted and so diametrically opposed to advancement, constituted a vital factor in the economic development of the Highlands.

The experiments in vocational education undertaken by the S.S.P.C.K. may appear of little consequence when viewed from the standpoint of modern educational aims and methods, but they were only on a parallel with the general state of educational development at a time when aims were definitely circumscribed and methods of attaining them necessarily narrow and shadowy. It is to be remembered that the educational practice of the Scots Schools during the period was limited in its application. The scholastic subjects taught by the schoolmasters never reached even a moderately high level, and the qualifica-

(I) Laing MSS. Div. II. Folio 623.

(I) MSS. Letter from John Laing to the
Soc'y. Gen. Mavor, 1792-1793
Dept. Folio 232.

tions of the schoolmasters themselves were deficient enough to set a narrow limit to educational progress.(I) It may be that the selected artificers and the spinning mistresses were more adapted to their particular work and more expert in demonstrating the arts of their particular trades than many of the dominies were to teach the scholastic arts. It may be that the influence of the system of vocational education reached as far as that of the scholastic if the merits of the respective systems are regraded as lying not so much in actual attainments considered from the point of view of numerical value as in the developing essays towards economic progress.

If only from the point of view that ideas were disseminated concerning improved methods of cultivation and of stock rearing, if only that in the midst of seeming squalor and idleness a new standard of living were upheld, and that the young were afforded opportunity to grasp the spirit of progress, the system of vocational education had its value.

It may be that the experiments of the S.S.P. C.K. only reflected the aims and methods of the Board of

(I) MSS Letter from John Erskine, to Wm. Ross, Secy. of Socy. 5th. March, 1762-- Register House Historical Dept. Folio 252.

Manufactures and supplemented the agencies established by that body to improve the social state in the Highlands, but it can scarcely be gainsaid that they hold a place in the history of Scottish Education and mark a period with the stamp of a progressive ideal.

The influence of the Board of Manufactures and of the S.S.P.C.K. may be traced in the proposals of Lord Gardenstone, Francis Garden, to establish an Academy of useful Arts at Laurencetown in the County of Kirkcaldy. Inspired with the idea of improving conditions of life in the little Burgh, Gardenstone prepared a scheme for the purpose of giving impetus to the local linen industry.

In a letter, dated 14th. March 1789 and written in Edinburgh, he sets forth the objects and proposed direction of his plan. (1) His purpose was to execute a Deed by which his heirs and successors should be bound to settle and secure a certain sum of money yielding One Hundred and Fifty Pounds annually, which was to be applied towards the distribution of pensions and premiums. Weavers, hucklers, wrights, wheel and reel makers, a teacher of linen-yarn spinning, with several apprentices were to benefit by the scheme, as well as the Master of the Academy, his Clerk, and three Deacons. The trustees nominated were the Bailie and Councillors of the Burgh.

(1) Laing MSS. Div. II. Folio 177.

Chapter Two.

Efforts of the Nineteenth Century.

Although the Academy was mentioned in Lord Gardenstone's ----- of Laurencekirk, not ----- to justify the conclusion, however, that the establishment was ever erected by that -----

The influence of the Board of Manufactures and of the S.S.P.C.K. may be traced in the proposals of Lord Gardenstone, Francis Garden, to establish an Academy of useful Arts at Laurencekirk in the County of Kincardine. Imbued with the idea of improving conditions of life in the little Burgh, Gardenstone prepared a scheme for the purpose of giving impetus to the local linen industry. In a letter, dated 14th. March ¹⁷⁸⁹ and written in Edinburgh, he sets forth the objects and proposed direction of his plan. (1) His purpose was to execute a Deed by which his heirs and successors should be bound to settle and secure a certain sum of money yielding One Hundred and Fifty Pounds annually, which was to be applied towards the distribution of pensions and premiums. Weavers, hecklers, wrights, wheel and reel makers, a teacher of linen-yarn spinning, with several apprentices were to benefit by the scheme, as well as the Master of the Academy, his Censor, and three Deacons. The trustees nominated were the Baillie and Councillors of the Burgh.

(1) Laing MSS. Div. II, Folio 177.

Although the Academy was mentioned in Lord Gardenstone's Letter to the inhabitants of Laurencekirk, children whom he fed, clothed, and educated, but the nothing appears in the Burgh Records to justify the conclusion, however, that the establishment was ever erected or that any experiment along the proposed lines was ever attempted. (I)

An individual experiment of greater importance and of wider influence was that undertaken by Robert Owen during the early part of the Nineteenth Century. As manager and part owner of the cotton spinning factory established by David Dale of Glasgow at New Lanark, near the Falls of Clyde, Owen early realised the necessity of improving the conditions of factory life. The mills, erected in the year 1784, were situated on a tract of land chosen from considerations of water power alone. The surrounding country was uncultivated, the approaches by road were entirely unsatisfactory, and the inhabitants were few. To supply the necessary labour, it was found advisable to procure child-apprentices from charitable Institutions, chiefly situated in Edinburgh, and to offer inducements to families to settle in the neighbourhood. Both methods of supply were subject to dis-

(I) Letter from W.J.Gordon, Laurencekirk, 23/II/30.

advantage. Dale provided accommodation for five hundred children whom he fed , clothed, and educated, but the children were compelled to work in the factory from six in the morning till seven at night, at which latter hour their education began. The protracted period of labour and the strain ensuing ~~were~~ the causes of much delinquency a common feature of which was the desire to desert. All those who withstood the desire longed for the ending of an apprenticeship which lasted seven, eight and even nine years, by which time the age of thirteen to fifteen years had been reached. When the period of apprenticeship ended, the children usually drifted back to the towns.

Owen recognised the disastrousness of such a system and abolished this method of labour supply, relying upon the encouragement given to large families to settle around the mills. The new population, however, could scarcely be regarded as entirely suitable for the formation of a regular self- subsistent colony. It was composed of the ignorant and the destitute, (I) and Owen readily perceived the need for a system of education, if permanent change was to be effected.

(I) "A Statement regarding the New Lanark Establishment"
 --- Edinburgh, 1812, Page 5.

In 1816, he erected a school in which children below the age of ten were taught various subjects according to their years, during a certain period of the day. (1) In the evening, the school was open to children and young persons of from ten to twenty years of age, who received instruction in Natural History, Geography, Ancient and Modern History, Singing, and dancing, besides the subjects of reading and writing. (2)

Owen soon realised, however, that the system of education which he had established was insufficient to supply the needs of the colony. In his search for a solution to his self-imposed problem of discovering a method potent enough to evolve a moral community, he came under the influence of Pestalozzi and Fellenberg. He visited the schools of these pioneers of modern education, and his further ventures in the realm of educational organisation and administration were largely influenced by the theories of Pestalozzi's educational philosophy and by the practical adaptation of them in the school of Fellenberg at Hofwyl.

Perhaps, the practice of Fellenberg determined

(1) "An Outline of the System of Education at New Lanark," by Robert Dale Owen- Glasgow, - Univ. Press. - 1824, Pages 31-32.

(2) Ibid.

the direction of Owen's future efforts and set him to the task of evolving a scheme of education which aimed at the creation of a moral and self-subsistent community. The basis of Fellenberg's practice lay in the theory that education must prepare the individual for a useful, happy, moral life. He believed that this ideal could only be attained through the agency of a practical training in the manual arts, particularly agriculture, although he recognised that the mechanic arts had subsidiary value.

This view of educational aim and method was an extension of Rousseau's principles, promoted by Pestalozzi, and it exercised a powerful influence upon the educational systems of many countries. Owen, in his New Lanark school and later in his New Harmony Establishment, Indiana, accepted the main contentions of Fellenberg. In 1819, he set up a new establishment at Lanark in which agriculture and manufactures figured as direct educational agencies. He considered that the basic industry of the colony should be agriculture, and he imagined that individual and social interests could be best served by joining work in the field with labour in the factory. To this end, he planned to train the

children of the settlement to gardening and manufactures during a portion of the day, and to employ all the men in agriculture and manufactures or in some other occupation for the benefit of the whole community.

Owen's system differed from that of Fellenberg. On his visit to Hofwyl, he saw that the methods of Fellenberg were autocratic, that the pioneer schoolmaster repudiated the idea of disturbing the order of society by confounding the classes. Following Pestalozzi who was the essence of democracy, Owen favoured a democratic method of control. He aimed at developing a new social organisation which would give employment to all and rationally educate all, that would yield men a sufficiency with absence of autocratic control. To this end he granted to each householder a garden to cultivate, and laid out a public garden to the extent of seven or eight acres to be worked by the factory hands for the purpose of supplying the whole community with vegetable produce. His system, idealistic for the period, exerted more than a local influence upon social life. It constituted a factor in the progress of practical education in Scotland which can scarcely be ignored.

The influence of Pestalozzi and Fellenberg, acting through the ventures of Robert Owen, and touching ^{the} mind of Lord Henry Brougham, affected the movements

struction in general and applied science, and the instigation of later attempts undertaken at the instigation of at least two Government Departments, and directed the educational policy of the country .

Two influences may be cited as bearing directly upon the schools during the latter part of the century as a result of the new psychological theories of Pestalozzi and of the practical applications of Fellenberg. The one emerged as an issue of the desire to promote a knowledge of science among the industrial classes.(1) The other originated in the concern of the Scottish Education Act of 1872 " to provide efficient education for the whole people of Scotland". (2)

Changes in educational outlook had been evident since the year 1866. The Science Movement had touched the schools, chiefly through the influence of the Science and Art Department, South Kensington. In both urban and rural districts the industrial populations of both England and Scotland had realised the need for knowledge of a more modern and more applicable nature. Their valuation of the New Movement had created a desire for in-

(1) Directory of the Science and Art Department, 1876.

(2) Report of Committee of Council on Education in Scotland, 1873.

struction in general and applied science, and the interest aroused among them through sense of the value of modern knowledge of physical law and principle, became a positive impulse and inspiration to the schoolmasters of the day. The wave of enthusiasm which issued upon the industrial populations through the zealous dominies whose shrewdness and whose apt appreciation of the possibilities of the new movement found expression in the feverish haste with which they adopted subjects to satisfy felt needs and aroused desires, proved to be the direct motive to the establishment of a system of education in practical subjects in the Scottish schools.

Among the industrial classes, widely divergent in environmental and occupational outlook, successful Courses in applied science were in active operation. In many cases these may not have been appropriate to the exact needs of rural society, but they formed the direct link between science as a theoretical study and science as applied to the purposes of exposing the inner workings of industrial process.

The spread of this general Science Movement, the appreciation of its possibilities, and the insight of rural educators at length centred interest upon Agriculture as a subject of value to the individual and to the social group to which by circumstances of enviro-

onmentn and of occupation he rightly belonged.

Influenced by the warranty of the Association of Schoolmasters " in the three Northern Counties", that one hundred and fifty rural dominies were prepared to teach Agriculture in their schools, (1) the Highland and Agricultural Society memorialised the Lords of Committee of Council on Education in Scotland craving attention to the fact that no schools existed in Scotland for the teaching of sciences bearing upon Agriculture. The contention of petitioners was that as the application of science was involved in the practice of field culture it was imperative that instruction in relative applied science should be diffused generally among all classes of agriculturalists. (2)

In 1876; the Committee of Council on Education agreed to recognise Agriculture as a subject eligible for Grant under the Science and Art Department's scheme, and this concession to rural communities afforded far-reaching opportunities. According to the objects of the Science and Art Department's scheme, the application reached both to the farm worker in receipt of a weekly wage and to the crofter whose income did not exceed Two Hundred Pounds per annum. Nor were the village school-

(1) Transactions of the Highland and Agricultural Socy.
1875, Page 21.

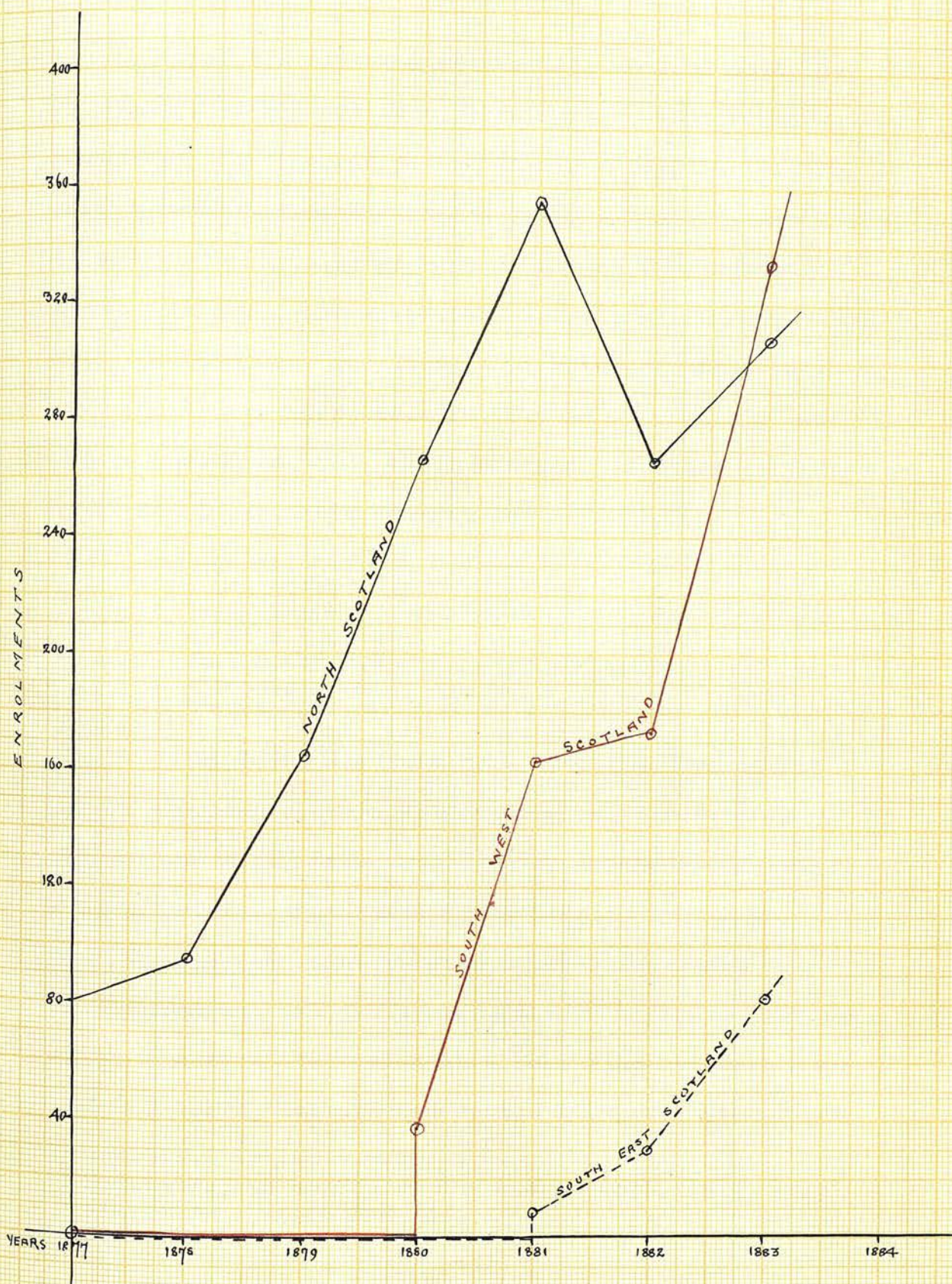
(2) Ibid.

master and his scholars in the seventh Standard overlooked. In the expansion of the Scheme's aims they were alike nominated for inclusion under the terms of benefit.(I) Thus was set up a scheme for the dissemination of scientific knowledge concerning agriculture. Its purpose afforded a general application valuable alike to the individual and to the rural community. The prominence of this purpose, its inherent latitude, and the possibilities involved in this direct attempt to reach rural society through contact with its life and its occupations gave value to the new movement which perhaps has never been fully appreciated.

But even in the early stages, when the freshness of the enterprise was full and when inducements to experiment along new lines were adequate and alluring to the progressive schoolmaster and to the questing rural populations which he served, we do not find such a diffusion of knowledge concerning agriculture as should have existed, especially in the Northern districts, fol-

(I) Directory of the S. & A. Dept. 31st. Edition, 1876, Page 3, vi. Twenty Third Report of the S. & A. Dept. 1876, Appendix A 2.
Trans. of H. & A. Socy. , 1876, Page 31.
Directory of the S. & A. Dept. 31st. Edition, 1876, Pages 2, iii, & 17, xlii. Also, Page 20, xliii.

GRAPH SHOWING ENROLMENTS IN AGRICULTURAL CLASSES
HELD UNDER THE SCIENCE AND ART DEPARTMENT'S SCHEME
FROM 1877 TILL 1883.



lowing upon the reported enthusiasm. We find that the assurances of the northern schoolmasters were not implemented. The innovation had little attraction for the farming communities who looked askance, and regarded it either with suspicion or with an amused intolerance.

By January 1877, (1) only seven schoolmasters, and those were northern men, had dared to experiment. Four of them were located in Aberdeenshire, two in Banffshire, and one in Caithness. (2) Their classes contained collectively eighty students distributed as follows;

Aboyne, (Coul P.S.)	10
King Edward P.S.	6
Monymusk P.S.	4
Rhynie P.S.	25
Rothiemay P.S.	13
Torphins P.S.	6
Watten P.S.	20

By 1879, Northern schoolmasters were operating in thirteen schools with a total enrolment of one hundred and sixty five, while in the South enthusiasm had not created the demand for a single experiment.

In 1880, eighteen classes with a total enrolment of two hundred and sixty six were held in northern districts, and in the south western area a beginning had been made in two schools, Maybole and Newton Stewart. Even by the

(1) Twenty Fourth Report of the S. & A. Dept. 1877, Page 141 et seq. Appendix B.

(2) Ibid.

year 1883, South Eastern Scotland was represented only by three schools, two of which were situated in cities, and one in the village of Inchtute. (1)

The spread of the movement cannot be regarded as eminently satisfactory during these years of trial before a daring Department of Education sanctioned tentative efforts in the village Day Schools, under the Code of 1883, but there are significant aspects of the movement which bear upon its retardation.

The perplexities investing the innovators were wrapped up in the system by which all Science and Art Classes were established. The motives existing in such establishment were coloured by ideas of monetary gain in Grants which accrued to the teacher upon the award of Certificates. Every School or Class which claimed attachment to South Kensington, was under the management of a local committee, consisting of a Chairman, a Secretary, and at least three members. (2) When the moving power behind this Committee was the school-master himself, who virtually selected the members from among his supporters, and when the onus of organisation

(1) Reports of the S. & A. Dept. from 1877- 1883.

(2) Directory of S. & A. Dept. 31st. Edition, 1876, Page 5,x.

was thrown upon the Dominie, who hazarded all upon a system "Farming" or " Payment by Results" which was not only fortuitous but openly iniquitous, it is easy to find a reason why, from among the generous list of Science Subjects offered by the Science and Art Department , Agriculture was so seldom selected by the timid schoolmasters. Where the criticisms of the practical farmer were severe upon the presumption of the Dominie in daring to instruct local opinion upon matters of occupational practice, the intentions of well-disposed schoolmasters were repressed.

Under such circumstances it is probable that the new movement failed to touch the village Day Schools before the year 1883. It could hardly be expected that it should do so in the initial stages of the development. Paucity of numbers in the Seventh Class of the School, the strict regulations regarding the number of lectures to be given before recognition could be gained, the extensive nature of the lecture-programme, and the possible effects upon school Grants, constituted factors of importance which hindered the extension of the movement to the Day Schools.

Moreover, the traditional attitude of the Scots to the education of the schools acted as a brake upon progress and innovation. The hankering after academic knowledge, and the relationship of the schools to

the Universities were powerful deterrents to the spread of scientific knowledge among the young. Even after the passing of the Scottish Education Act of 1872, when opportunity was given for a wider outlook upon education, the traditional brake was still applied with effect. The "Higher Subjects" of the Parish School as well as of the Secondary School were mostly confined to what was necessary for the few destined for the Universities. (1)

The sources of direct and conclusive evidence on the matter are the Statistical Accounts of the Committee of Council on Education in Scotland, and the Log Books of the Schools. These sources by no means indicate that Agriculture figured in the Day School Curriculum before the year 1883. Little can be deduced from the Statistical Accounts beyond the fact that the teaching of Agriculture gradually spread throughout Scotland generally. The recorded successes at the yearly Examinations fail to differentiate between adult and juvenile attainments. The Department in the Returns were only concerned with individual groups, irrespective of age, and the records of successes within the groups offer no conclusive evidence that school pupils were represented at the Examinations in Agriculture.

When we turn to the Log Books of the Schools,

we find perplexities. These records of school progress which may justly be regarded as reliable sources of information are entirely silent upon the matter of Agricultural teaching before the year 1883. The Log Books of schools situated in rural districts where for years the subject of Agriculture had been taught in Evening Classes from 1876, (1) make no mention of the matter. When it was not only customary but also incumbent that precise records of progress should be regularly made in the Day School Logs, it can scarcely be believed that the astute schoolmasters of the period omitted to record the institution and progress of a new subject. The possibility is that where difficulty was always experienced in obtaining matter of moment to chronicle, the new subject would have found a prominent place in the school Log Book, if it had appeared in the curriculum.

The Log Books ignored the Science and Art Classes before 1883, a fact which is scarcely to be wondered at when we consider the methods by which these classes were established. Day and Evening Classes could hardly be regarded as parts of the same dove-tail. The connection between them was severed by the very nature of their separate institutions. The one implied an appointed duty upon fixed terms. The other was in the nature of a private venture undertaken upon probable chance.

 (1) Logs of Schools mentioned in S. & A. Reports.

Where such ideas of complete separation existed, it was unlikely that the schoolmasters would record in their Day School Log Books what was relative to their peculiarly private ventures in the sphere of monetary gain. If any records were kept, their repository would be either the schoolmaster's file or the Secretary's desk. These, no doubt have long since been cleared.

This conjecture finds a certain corroborative evidence in the fact that the Science and Art Classes in Agriculture were not always conducted in the village school, but were often housed in the village Hall or in the buildings of the Mechanics' Institute. Individual instances of this occur in the Statistical Accounts regarding Classes at Echt (Village Hall), Thurso, (Mechanics Institute), Cluny (Millbank Hall), Annan (Kinmount House), Darvel (Brown's Institute). (I)

An important aspect of the question lies in the influence exerted by the Mechanics' Institutes themselves. The forward movement of these bodies operating throughout the country had an inspiring effect upon the Science and Art Classes, and it appears that the promoters of several Agricultural Classes were none other than the enthusiastic members of the Mechanics' Instit-

(I) Reports of the S & A. Dept. from 1877 till 1883,--
List of Classes-- Appendix.

utes. Moreover, in many districts the services of a teacher, other than the local schoolmaster, were often secured, and his classes were held, not always in the village Halls or in the Mechanics' Institutes, but more often in the schools. (1) Where the Classes were conducted in buildings outwith the school, the records, if such existed, have disappeared. Where a teacher from a neighbouring Parish was employed, access to the Day School Log Book would be impossible, and all records concerning the institution and progress of the classes would disappear with the teacher, or find a corner in the domicile of the local Secretary. Search of Individual School Log Books (2) confirms this view.

The Reports of the Committee of Council on Education and the Log Books of the schools yield no information regarding the nature of the instructional methods employed by the schoolmasters. An account of such methods can only be given from the testimony of those who taught the subject of Agriculture or were students in the Classes in the heyday of the movement.

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- (1) Ewart Institute, Newton Stewart; Rendall, Kinnoir, Harray, (Orkney); Shenwell, Alehoushillock, (Aberdeenshire).
- (2) Aboyne (Coul P.S.); Monymusk; Alvah (Linhead P.S.); Maybole (Carrick Academy); Macduff P.S.; Closeburn, Wallace Hall Academy; Inverary (Newtown P.S.); Lomnay P.S.; Wick (Pultenaytown Academy); Hamilton (St. John's Grammar School).

Fortunately, such evidence is available.

The Scheme of the Science and Art Department with its wide scope of subjects and its requirement of a minimum of twenty lectures, was largely responsible for the prominence given to theoretical treatment of all subjects professed, and for the vicious practice of following the narrow limits of a Text-Book. We hold it on evidence that even as late as 1891, when the movement had spread considerably in the north of Scotland, bookish methods were still employed. "The examiners for Agriculture were Professors Wrightson and Tanner each of whom had written a book, and they set the paper in alternate years", (1) so the students were careful to study the book of the examiner of that year. Such a system impaired the vigour of the movement and detracted from its educational value, but it was only following the established practice of the period with regard to all science teaching.

The best features of the prevailing methods may be discerned from the following evidence;

"The Manual we used, if I remember rightly, was "Principles of Agriculture" in three parts, to be had collectively or separately. I used my own notes culling information from Wrightson, Tanner, and oth-

(1) Letter received from F.G.Young, Esq. formerly Executive Officer to the County of Orkney Education Authority, dated 8th. February, 1929, Page 6.

ers, as well as from the Agricultural Journals-- "Farming World", "The N.B. Agriculturalist", "The Scottish Farmer", "The Dairy", etc.

For the adult classes I had drawn up 28 lectures covering the syllabus of the S. & A. Dept. and the requisite number of openings." (1)

"Mr. S-----," (a member of Birsay Class, Orkney, in 1889) "states that the class partook of the nature of a lecture course though well illustrated by experiments and demonstrations; the value of the class was also enhanced by visits to various farms in the district where the lecturer took full advantage of his opportunities to show the practical application of the principles enunciated during the course." (2)

The lecturer of the class was George Duthie, the schoolmaster of Birsay. (3)

"I cyclostyled notes of my lectures for every pupil. I had a lantern with some very fine slides illustrating the effects of manures on cereals, turnips, potatoes, and vegetables; some botanical slides, different breeds of horses, cattle, etc. We had no plots in these Parishes" (Keith and Cairney, Aberdeenshire). (4)

"Messrs Middleton and Omand carried out experiments in a piece of ground adjacent to the school. Mr. Spence and myself did our experiments in the school garden. They had experiments in the class-room,

- a. The germination of seed of various plants.
- b. Passage of moisture through root hairs.
- c. Fate of ascending moisture.
- d. Examination of plants grown in rich soil com-

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- (1) Letter received from Alex. Middleton, Formerly schoolmaster of Dounby School, Orkney, dated 28th. February, 1929.
 - (2) Letter received from F.G. Young, dated 4th. March, 1929.
 - (3) Ibid.
 - (4) Letter received from Alex. Middleton, 13th. March, 1929.

- pared with those in poor soil.
 e. Showing leaves of plants giving off oxygen.
 f. Breathing of plants.
 g. Showing the best condition of soil to be wrought.
 h. Life in the soil.

The Text- books most in use were;-

- "Elementary Agriculture" by H.J.Webb.
 "Principles of Agriculture" (Blackie and Sons).
 "Agriculture" by Alfred T. Burgess.
 "Agriculture" by Wright.
 "Fields of Great Britain" by H. Clements.
 "Elementary Lessons in Agriculture" by Tanner. "(I)

The system of agricultural teaching , begun from a theoretical aspect, continued to progress along the lines of such stock Text-books towards examination results, in many cases, without diverging into the path of practice in the school environment. The endeavours of the more diligent and progressive schoolmasters , however, found further expression in attempts to relate the theory of the text-book and of the school class with the practice of the field, and although such relationship was limited and more or less tenuous by reason of varied circumstances, it existed as a fragile link between the school and the rural community and was thereby of value from the educational standpoint.

(I) Letter received from Fred. S. Scott, Late headmaster of Cross, Sanday, and Stenness Schools, Orkney, dated 18th. June, 1929, Page 2.

What was perhaps expressive of the best teaching methods both from theoretical and practical aspects may be recognised in the work of the Orkney Pioneers of the movement, notably at Dounby "science" School. (I) The influence of the movement was felt in the far Isles in the year 1886, so that the achievements of the Orkney schoolmasters may justly be regarded as typical of the foremost school influences at a time when the whole science movement was in a state of rapid expansion. When Dounby School began the experiment of teaching agriculture in 1886, there were in Scotland some sixty two schools engaged in teaching the subject. Thirty four of these were situated in the northern counties, which had already experimented with subjects in pure and applied science more or less unrelated to the needs of rural populations. The whole science movement in the north influenced the trend of education in Orkney. In 1885, Alexander Middleton, the schoolmaster of Dounby, had started the first classes in the Islands for the teaching of science. His action in so doing was considered bold. The innovation, the first of its kind north of the Pentland Firth, surprised the Science and Art De-

(I) "Scottish Journal of Agriculture", Vol. xii, No.4, October 1929, Page 419.

partment's Inspector, " an old Colonel C--- who crossed the Pentland Firth on a winter night to visit " Dounby by Kirkwall", and who knew as little of the exact location of the place as he did of the subject he was to examine. He was quite angry that on arriving at Kirkwall he had 14 miles to drive before he saw this 'innovator'. (I) When eventually he reached his destination, he was surprised at so bold an attempt to teach science subjects in a country so remote. The results of the innovation proved encouraging, and Middleton, realising the importance of agriculture as a subject of vital interest to rural society, followed the agricultural-teaching movement already established on the northern mainland. During the year 1886-7 Dounby had a class of twelve students engaged in the systematic study of agriculture. In 1889, a practical development was begun with a scheme of actual agricultural experiments carried out in the neighbourhood of the school. The history of this new development is illuminating, and in the words of Middleton intrinsically authentic.

" When the Department of Agriculture-- some such name as that, now the Board of Agriculture-- came into being, it began to encourage Agriculture by giving Grants for Experiments. On the recommendation of a Mr. Welsh, H.M.I. and Professor Andrew

(I) Letter received from Alex. Middleton, 28th. Feb. 1929.
Page I.

(I) Letter received from A. Middleton, 28th. Feb. 1929.
Page 1.

Jamieson of the W. of Scot. Technical College, Glasgow, an application was made. I was given an Annual Grant of £25 for carrying on Experiments on Cereal and Root crops. I had a large garden, about an acre in extent and I rented another acre of uncultivated ground growing chiefly heather. This I ploughed and subsoiled and was soon able to divide it into some 8 plots which were sowed with oats-- 1 plot unmanured; 2 Superph. alone; 3 Superph. & Nitrog.; 4 Superph. , Nitrog. & potash (one plot nitrogen in form of Nitrate of Soda, another Sulph. Amm); 6 Cereal manures supplied by local dealers etc.

In the garden I had such root crops etc. as the pupils read about in their Agricultural Manual--- beet, sugar beet, carrot, onions, lucerne, sainfoin, mangels, turnips etc. This was carried on for five years, when the money was voted to County Council to allocate as they saw fit. The result was it was not voted for agr. purposes." (1)

" In Dounby both the garden and Experimental field were prepared as far as possible by horse labour." (2)

" In a neighbouring field on Dounby Farm the farmer allowed me to experiment on his turnip crop. Several drills (8), got a liberal dressing of Farm-yard Manure, half were treated with superphosphate and half with basic slag (same money value) . The results were very similar, but if any the slag seemed to have it. Only next year the residual effects of slag compared with superphosphate were marked on the succeeding crop of oats, the colour and more vigorous growth side by side led to my being questioned as to the reason." (3)

The influence of the movement begun by Middleton spread to neighbouring villages and established a new interest not only among the farming communities, but

(1) Letter received from Alex. Middleton, 28th. Feb. 1929, Page 2.

(2) Letter received from Alex. Middleton, 13th. March, 1929.

(3) Letter received from A. Middleton, 28th. Feb. 1929, Page 4.

also among the professional classes. In 1888 Middleton conducted a successful evening class in the subject of agriculture at Harray, and his enthusiasm drew not only country youths but also farmers of mature years, who came from distant parts of the country side in order to qualify for presentation at the Science and Art Examination. (1)

In the same year the influence of the movement touched Birsay, where George Duthie, the schoolmaster, conducted classes in the subject, and although he had no garden for practical demonstrational purposes, his lectures were illustrated by indoor experiments and by visits to neighbouring farms. (2)

From 1890 onwards, classes were held at Fins-town, Firth Public School, at Stenness, and at Rendall, by the late William McKay, the late Magnus Spence, the late James Omond, and Fred. S. Scott respectively. These schoolmasters were imbued with a love for rural life, and were notable students of botany. Spence, reputed the strongest and ablest Orkney schoolmaster of his generation, was a keen naturalist. His published works, "Flora Orcadensis" and "Standing Stones of Stenness", are of standard merit. While serving as schoolmaster at Stenness,

(1) Scottish Journal of Agri. Vol. xii, No. 4, Oct, 1929, Page 421.

Letter received from A. Middleton, 28th. Feb. 1929, Pages 3 & 4.

(2) Scottish Journal of Agri. Vol. xii, No. 4, Oct, 1929, Page 421.

at which place he was located from 2nd. February, 1875 until 23rd. March, 1891, he was in charge of the Government Meteorological Instruments, and when he was promoted to Deerness the meteorological station was transferred with him. (1) At Deerness he often took his day school pupils for rambles,-- an early indication of the School Journey, when his talks furnished practical illustration for the nature study lesson. (2) His Log Books, however, show no trace of the establishment of agricultural classes, although he was certainly teaching agriculture in evening classes according to the Science and Art Department Scheme. In the year 1890-1 he is reported as conducting a class of 35 students for which he received a grant of Twenty One Pounds. (3) Evidence has been furnished to show that even when he had left Stenness for Deerness, he returned at least once to conduct the evening class at the former place, the subject being 'Advanced Agriculture'. The Thirty Ninth Report of the Science and Art Department, 1892, (4) states that for the year 1891-2, he had a class of twenty five students who earned for him a grant of Twenty

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 (1) Letter received from A. Middleton, 13th. May, 1929, Page 1.
 (2) Letter received from F.G. Young, 8th. Feb. 1929, Page 2.
 (3) Thirty Eighth Report of S. & A. Dept. 1890-1, Page 95.
 (4) Thirty Ninth Report of S. & A. Dept. 1891-2, Page 127 et seq.

Five Pounds.

James Omond, who died at Kirkwall in 1927, was a type of schoolmaster who would have made an excellent science master. (1) He possessed the spirit so essential in a rural dominie. He had a great love of the open country and was an authority on the flora and fauna of Orkney. His qualities as a naturalist were reputed higher than those of Spence, but he was an out and out field-man, and except for rough notes which he compiled, he could never be persuaded to set his researches into book form. While he was schoolmaster at Rendall, he conducted Evening Classes in agriculture, and the Thirty Ninth Report of the Science and Art Department shows that in 1892 he had a class of twenty four students who gained a grant of Twenty One Pounds. (2)

Omond, Like Middleton, experimented with crops on a piece of ground adjacent to his school, while Spence and Scott demonstrated in the schoolhouse garden. Each was alive to the value of a correlation between outdoor and indoor work, and the nature of the experiments attempted within the narrow limits of a class room reveals the progressiveness of their labours at a time when criticism was severe upon the vicious practice of

(1) Letter received from F.G. Young, 8th. Feb. 1929.

(2) Thirty Ninth Report of the S. & A. Dept. , 1892, Page 129 et seq.

the schoolmasters who were adhering to the lines of a simple text-book. (1)

The work of such pioneers of practical education could scarcely fail to evoke criticism. When to theoretical teaching there was added the questionable experiment of practice in the field or garden, and when the innovation and the progress of the movement in farming districts were due to the schoolmasters, there existed provocation to criticism mildly adverse. This, however, was effective only in focussing interest upon the movement and in increasing its effectiveness among the working classes. Middleton states that "the subject being new to Orkney, considerable interest was evoked. Some newspaper correspondence was started which proved a cheap advertisement and added to the interest." (2)

Dr. John Anderson of the College of Agriculture, Aberdeen, who was a pupil-teacher at Stenness from 1888 till 1891 and a student of Spence's Evening Classes in agriculture, in a letter to F.G. Young, related that "the classes caused great amusement and most of the farmers were sceptical of any teaching in agriculture that a non-farmer could do". (3)

This criticism levelled at the achievements of

(1) Journal of Agriculture, Vol. xii, No. 4, Oct. 1929, Page 421.

(2) Letter received from A. Middleton, 13th. March, 1929 Page 3.

(3) Letter received from F.G. Young, 8th. Feb. 1929, Page 6.

the schoolmasters, created difficulties at a time when agricultural education was struggling. The prevailing scepticism in certain rural communities proved, however, that a larger interest in rural affairs had been roused, that the farming classes were alive to the motive underlying the movement, although they did not realise the educational value accruing from a scientific knowledge of field practice, and that beneath the expressed adverse criticisms there lurked the suspicion that farm workers who mostly filled the classes were imbibing knowledge of rural lore and method at the hands of the schoolmasters which might affect traditional practice .

Over against such biased opinions we may place the criticism of Professor Tanner, the Examiner for the Science and Art Department , who in 1877 evaluated the movement from the standpoint of the theoretician, drawing his conclusions from the evidence of the written papers put into his hands.

"Upon the general character of the answers from candidates I would remark that they bear evidence of a strong educational force in the country which is doing thoroughly good work. With a little encouragement and a more or less complete organisation these advantages may be more widely extended and become a great benefit to the agricultural community."

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- (I) Twenty Fourth Report of the S. & A. Dept. 1877, Appendix B, Page 40.

(2) Letter, *ibid*; 25th. Feb. 1949, Page, 4.

(3) *Ibid*; Page 5.

But the most convincing evidence regarding the adequacy or inadequacy of the movement is to be found in the enthusiasm of those youths and men of mature age who attended a course of twenty lectures and braved a written examination at the Session's close, students who had a practical sense of the value to themselves of a knowledge of rural affairs and of all that underlies the occupational use of environment. This enthusiasm militated against the hasty conclusions of the critics.

" In these parishes", --- (Keith and Cairney--- the pupils were all farmers, farmers' sons, or farm servants,"in ages ranging from say 18 to 67. " (1)

" Pupils came from considerable distances-- one from Stenness 5 miles off-- put in his requisite minimum of attendances that he might sit for a certificate. He was a farmer. In those days it strikes me there was far more interest shown in vocational education than in these. " (2)

" In Keith the average age of pupils might be 30 although some were over 50. In Cairney I had pupils of 50, 60, and 67 years of age. So you can imagine a ' dominie' had to be very careful with those old practical farmers. Of my pupils one was first in Agriculture for Aberdeenshire, and it was amusing to learn that the 'old one' of 67 was so disappointed that he was not so successful as 'Robert' as he termed him, that he wrote the Examiner to see how many marks he was behind him. This I mention to show the interest manifested." (3)

(1) Letter received from A. Middleton, 13th. March, 1929, Page 2.

(2) Letter ; ibid; 28th. Feb. 1929, Page, 4.

(3) Ibid; Page 5.

One aspect of this evidence is illuminating. The catholicity of opinion among progressive farmers and farm workers as to the apparent advantages of the movement indicates a realisation of the need for modern knowledge of the basic facts of environment and of the principles underlying occupational practice. The fact that in the body of these Evening Classes, and probably as their mainstay, there were agriculturalists of wide practical knowledge and experience who appreciated the value of the vocational instruction imparted at a time when criticism was severe, somewhat confounds the critics and commends the schoolmasters. The desire for scientific knowledge concerning land culture, the enthusiasm which urged attendance at lectures, and the fortitude of elderly farmers in facing the ordeal of a written examination, are indications that the movement held a place in the scheme of rural society, whatever criticisms may be levelled against the imperfections in educational method.

The mode of presenting the facts of environment and the principles at their foundation may often have been those which a more advanced educational practice and a more highly developed educational theory might reject. The attempts to demonstrate, to illustrate, and to experiment, whether on a plot of ground or within the

walls of the schoolroom, may have been inadequate to meet the social necessities, but the incidence of the existence of a system of correlation between theoretical and practical, the relating of school learning to farm occupations and rural situations in general marked an advance in educational practice and constituted an influence in community life which reflected not only on farm practice but also upon individual outlook on environment. The emphasis laid upon principles opened the view to a better understanding of routine practice in the field. The directing of interest towards the secrets of environment gave new meaning to common things and processes. Rural life and occupation derived a new connotation. Appreciation of the practical value of the science of events, of everyday occurrences, of rural facts and rural situations, conveyed a motive to rural society and imparted an influence the diffusion of which gave uplift to community interests. Rural populations in Scotland, awakened to realisation of the inheritance of nature and of the worth of labour, perceived in the accumulation of facts and situations which surrounded them a new meaning and a fresh motive to endeavour.

Whatever faults may have been operative in the movement through lack of insight or of complete organisation, whatever blame may be imputed to the zeal of

the schoolmasters or to their failures, there is reason still to believe that the work was worth while in that time of scientific progress, and that by the efforts of the schoolmasters the way was paved for a later system of teaching and a basis laid for the building of the structure of modern agricultural education.

The pioneers of the movement lived before their time, labouring under difficulties unknown at the present day. In spite of the inherent obstacles to progress, of adverse opinion and discouragement, and at the hazard of their livings, they spread abroad an enthusiasm for a scientific knowledge of environment which influenced rural society and gave uplift to rural community ideals. If their achievements appear diminutive before the enterprises of modern times, if their influence upon society of the period seem shadowy, there is still reason to insist that the achievements and the influence were compatible with the encouragement afforded and with the state of imperfect expansion in which the whole science movement existed at a time when science was on the move.

If the movement affected nothing more than the arousing of interest in rural occupations of staple importance, and in the value of immediate environment to the development of both mind and industry, it accomplished a purpose in social evolution of educational and of economic importance.

Chapter Three.

Among The Specific Subjects.

Insufficiency of evidence excludes commitment to the general statement that the influence of the Science and Art Department extended directly to the Day Schools of Scotland, as far as the teaching of agriculture is concerned, prior to the year 1883. There is reason to believe, however, that the infusion of interest yielded by the establishment of agricultural teaching in Evening Classes had an indirect effect upon subsequent proposals to institute vocational education in the village schools. The trace of the whole science movement seems to reveal the fact that whatever had been experimented upon among adult populations found a place, sooner or later, in the Day School Curriculum as a sequel to the expressed desire of the Scottish Education Act of 1872 which was inspired by the hope for a complete, efficient education that would touch the lives of the whole people of Scotland. (I) The Act had given let to a broader conception of the meaning and value of education to the individual. It offered a wider view to educational means and

(I) "Early Teaching of Science in Scottish Elementary Schools", by J. Mason,-- Scottish Educational Journal, Vol. xii., No. 28, July, 12th. 1929, Page 805.

methods by providing for the interests and social needs of the average pupil in the upper standards of the school. It directed attention to the intimate requirements of the social state and to the necessity for a broader educational system based upon ideas of industrial progress.

The Code of 1874 with its offer of four shillings per subject " for every day scholar presented in Standards IV-VI," who passed the test in not more than two " Specific Subjects ", (1) conceded no ^{fewer} ~~less~~ than thirteen subjects for choice, six on Languages and Mathematics, and seven on Science. The selection was based upon considerations for the traditional ideal and attitude of the Scottish educational system, and for the ' new science movement with its urgent claims on behalf of the industrial populations'. (2)

The Fourth Schedule of the Code was ' primarily intended for the Elementary School' where the scholars, generally speaking, were preparing for a life of work in which a knowledge , elementary perhaps, of mechanics, physics, or chemistry, would be more useful than a mere smattering of Classics. (3)

The proposals set forth in the Schedule are

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- (1) Report of Committee of Council on Education in Scotland, 1873, -- Code, Article 28.
 - (2) "Early Teaching of Science in Scottish Elementary Schools", Page 805.
 - (3) Ibid.

more or less a replication of what had been attempted under the Science and Art Department's Scheme for Evening Classes. Comparison reveals an almost identical selection of subjects. (1) This fact of similarity constitutes a marked feature of the indirect influence which South Kensington exerted upon the early science movement in the Elementary Day Schools, both with regard to the aim and the methods of teaching. Moreover, it is apparent that those factors which militated against the progress of the Science and Art Classes in the early days of their institution are also those which hindered the spread of the new movement in the Day Schools. In the matter of subject-choice we find the influences of pecuniary considerations and the peculiar likes and preferences of the Schoolmasters operating, "not according to the needs either of the individual on the one hand, or of the community on the other." (2) Teachers of the traditional order had "a reputation to uphold; the moderns had theirs to establish; both had extra grants in view. School Authorities accepted their responsibilities in the matter with quiet complacence, leaving the selection of subjects to the Dominies, ignoring the op-

(1) "Early Teaching of Science in Scottish Elementary Schools", Page 805.

(2) Ibid, Page 806.

inions of the community (if it gave expression to any), satisfied if the local treasury benefited to any appreciable extent by the Grants gained. There was at least a modicum of truth in the criticism which caustically averred that ' the school exchequer, however, had more to do with choice than any special fitness for teaching the subject, or any special desire or aptitude for learning it. ' " (1)

" Where considerations of grant-earning power took paramount place, it is surprising to find that the order of preference of the science subjects was inversely proportional to the educational value, and that the system gave rise to summary imperfect methods of attaining the end in view. Preference appears to have been based on an a priori determination of the minimum time required to master the subject, and the trace of increase in presentations for examination shows a distinct tendency in the direction of the easy subjects." (2)

" Considerations of time, which could be computed in months, if not in days, prompted methods of learning by rote, and those subjects which lent themselves to short-cuts in the learning process, subjects which by the aid of ' some tiny class-book without the slightest real, living, and practical knowledge ' could be mastered in the shortest possible time were preferred

before all others with a wonderfully audacious indifference to the definite injunction that instruction should be given mainly by experiment and illustration, and that nothing like learning by rote could be accepted. " (I)

" But the astonishing feature of science teaching in Scottish Schools during the period under consideration was that although in rural districts an outdoor laboratory and a wealth of natural illustration were readily available, few schools professed to teach even the elements of natural science."

In the rural districts of Elgin and Nairn at date 1883 no attempt was being made to teach even the elements of Botany, although Physical Geography, Animal Physiology, and Domestic Economy were professed. Lanarkshire was in no better state. Twenty five schools in the county were teaching Animal Physiology, fifty three Physical Geography, and one hundred and thirteen Domestic Economy, with presentations of 1174, 1931, and 4448 respectively, but not one school had utilised the rural environment. Even Dumfriesshire, Kirkcudbrightshire, and Wigtownshire, counties of recorded agricultural in-

(1) "Early Teaching of Science in Scottish Elementary Schools", Page 806.

terest admirably suited for the approach to Naturkunde,
 could only boast of one school with two presentations in
 Botany, while eleven rural Dominies were disregarding op-
 portunity by instructing their pupils in Animal Physiol-
 ogy, and sixty two were striving to impart notions con-
 cerning evaporation and condensation, the atmosphere and
 its composition, and such like, from the pages of an ill-
 informed text-book. Perthshire, with its wonderful
 facilities for the direct study of nature, was represent-
 ed by seven schools in the subject of Botany, while twenty-
 three schools professed Animal Physiology and sixty seven
 Physical Geography. " (I)

It was apparent that a revision of circum-
 stances was necessary and that attempts should be made to
 check this lifeless, motiveless striving after artificial
 effects in the rural school. The facts revealed that re-
 conciliation between the village school and village soci-
 ety could only be attained through the wider influences of
 a knowledge bearing directly upon rural life and occupa-
 tion. The educational advantages accruing from bookish
 conceptions of facts were not compatible with the needs
 of the future rural worker. Rural community life required

(I) " Early Teaching of Science in Scottish Elementary
 Schools", Page 806.

definition of aim with respect to the nature of the scientific knowledge which should be imparted to the young.

It had already been evident that the association of education with life-interest was of paramount importance to the adult, that knowledge and life are so closely inter-related that to separate them is to defeat the purposes and efficacy of both; but apparent lack of enterprise on the part of the schools had precluded experiment upon direct correlation between the Day School and its immediate environment to any appreciable extent. The function of the village school had remained obscure although the light of scientific knowledge concerning immediate neighbourhood was playing full upon the work of the rural Evening Class, and the linking of environment, occupation, and life to the adult educational system was more or less complete. The educational outlook was in expansion, and the science movement was spreading rapidly among rural populations, but the Day Schools were laggard, following the path by which the adult movement had attained to the advantages of applied science, failing to adopt those subjects which had proved of value to the members of rural communities, and electing those which were questionable in their ultimate effects and sometimes disastrous in their immediate results.

A new direction to effort was given to the Day Schools when "The Principles of Agriculture" found a niche in the Fourth Schedule of the Code of 1883. (1) The allowance of a Grant of four shillings per subject for every day scholar presented in Standards IV-VI who passed a satisfactory examination in not more than two Specific subjects was extended so as to include the village pupil who studied Agriculture, and this provision allured the progressive schoolmasters in the North from the commencement of the movement. (2) It was to be expected that the Day Schools in Northern Districts should be touched by the influence of this greater latitude during the opening years of the experiment. During the four years from 1883 till 1887, northern rural schools were in advance of those in the western and southern areas. By 1884, one hundred and thirty three pupils were under instruction in the subject of Agriculture in the North, while in the western districts the number did not exceed fourteen, and the southern counties presented only thirty three. Aberdeenshire with part of Kincardineshire accounted for fifty one presentations, Inverness and the Mainland of Ross for twenty nine, Banff

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- (1) Report of Committee of Council on Education in Scotland 1882-1883, Page II3, and Appendix I, Page II7.
 (2) Code of Regulations with Appendices, by the Lords of the Committee of the Privy Council on Education in Scotland 1883--- Article 2I, Page 9; Fourth Schedule, Page 33, Head I4.

with part of Aberdeenshire for twenty seven, and North Forfarshire for twenty three. (1)

The fourteen pupils in the western district were the representatives of Renfrew, Bute, and Argyll. (2) In the Southern Division only one school in the district embracing Edinburgh, Haddington, and Linlithgow shires had begun the teaching of Agriculture to three scholars, (3) while in the whole agricultural area occupied by the Counties of Peebles, Selkirk, Roxburgh, Berwick, and two parishes in Edinburgh the experiment had been attempted in only two schools with a total of six pupils. (4) Perthshire, a County of extensive rural opportunities, was represented by twenty four scholars scattered throughout three schools.

By the year 1885, Peebles, Selkirk, Roxburgh, and Berwick shires with two Parishes in Edinburgh could only account for ten scholars in two schools, (5) Dumfries and Kirkcudbright shires for seventeen in three schools, Fife, Kinross, Clackmannan, and five Parishes in Perthshire for nine in one school. (6) In the Western Division during the same period, North Byrshire was represented by two schools with four pupils, Renfrew and Argyll by three

(1) Report of C.C. E.- General Report-- 1884, Northern Division, Appendix, Page 179.

(2) Ibid; G.R.-- Western Division, Page 195.

(3) Ibid; G.R.-- Southern Division, Page 225, Appendix.

(4) Ibid; G.R.-- Southern Division, Page 228, Table 4.

(5) Report of C.C.E.-- G.R.-- 1885, Southern Division, Page 188.

(6) Ibid.

schools with twenty five pupils, Perth, Linlithgow, and Stirling shires by one school with two pupils, while in southern Ayrshire and in Wigtownshire the movement had so far failed to touch the rural school. (1)

The development of the movement in the village schools of the North, particularly of Aberdeenshire and Banffshire, during the period of the first four years was almost inevitable. In these northern counties marked enthusiasm had prevailed among the adult populations and a stage in rural education had been reached by the year 1883 when direct contact had been established between the school and the environment. There existed a realisation of the importance of the relationship established and of the need for the enlargement of the new influence. The Day Schools were ripe for the institution of agricultural instruction. Opinion, influenced largely by the enthusiasm of the schoolmasters, had completely veered from the traditional to the modern. The atmosphere of the science movement had permeated the rural districts, enlivening the desire for a practical application of scientific knowledge to immediate environment. The official view of the situation as it existed at the close of 1884 is corroborative.

(1) Report of C.C.E. -- G.R. -- 1885, Southern Division, page 188.

Report of C.C.E.-- G.R.--1885, Western Division, Pages 221, 222, 223, 224, 226, 227.

" Before the Specific Subjects came into force the Bursary Competition regulated the direction and registered the success of all the higher instruction in the schools. The action of the Code has materially changed all this. It would not take more than the five fingers on one hand to count the schools which have steadily adhered to the traditions. " (1)

The trace of progress in the Day Schools is significant of the general development of agricultural teaching in the three divisions of Scotland , north, west, and south. By comparison of statistics (2) we find that whereas between 1883 and 1889 progress in northern districts was definitely marked by steady increase in Evening Class enrolments in the subject of Agriculture, beginning with two hundred and eighty nine in 1883 and reaching eight hundred and seventy four in 1889, development in south eastern areas was comparatively slow, enrolments in 1883 being only eighty two and in 1889 three hundred and twenty four.

These statistics in comparison with Day School enrolments and presentations in the subject of Agriculture

(1) Report of C.C.E.-- G.R.-- 1884, Northern Division, Page 178.

(2) Reports of the Science and Art Department, 1883 till 1889.

show that a parallelism existed between progress in Evening Classes and progress in the village Day Schools, and that differences in rate of development of the movement in Day Schools were dependent upon definite factors determined by circumstances inherent in immediate environment. Where the movement progressed slowly among adult populations a corresponding retardation appeared in the village schools. Slow development may have been due to traditional attitude, as in the case of Evening Classes, to lack of appreciation on the part of the populace, and to the want of enthusiasm and necessary knowledge on the part of the schoolmasters. Professional prejudice on the part of both agriculturalists and teachers may have accounted for much of the retardation that existed. The former, who constituted a large proportion of the ruling body in rural areas, may have limited the power of the schoolmasters by the narrowness of their outlook upon education, and by the acceptance of the view that agriculture was a subject unfitted for the school. The latter, whatever may have been the outward bar to progress, may have encouraged prejudice because of lack of knowledge. That many schoolmasters were deficient in information regarding rural affairs is borne out by the Official Reports. As late as 1889 it was reported concerning the Southern Districts;

"It is a subject that deserves more encourage-

ment in a County like this; but it does not now, as it did 35 years ago, form part of the Course of the Training College, and the reason for neglecting it is probably that the teachers know little about it. " (I)

Statistical Records become illuminated by the incidence of certain references to the potent influences of three main affects,--- the progressive attitude of the Free Church Training College, Aberdeen, which was no doubt responsible for much of the rapid development in the North after 1890, the growing interest evinced by various County Councils in agricultural areas, and the impetus afforded by the establishment of classes for teachers both at local and University centres.

In 1890, the Free Church Training College, Aberdeen, provided a Course in Agriculture for students whose prospects lay in the direction of the rural school where a knowledge of rural occupations and the principles underlying them could be utilised in giving zest to school life and in forging a link between the school and the community.(2) This step, encouraged by the Education Department, gave to rural life an infusion of interest and of educational

(1) Report of C.C.E.-- G.R. 1889, Southern Division, Page 234.

(2) Report of C.C.E.-- 1890-91, Page xxiv.

opinion opposed to the traditional, and was destined for a time at least to influence the trend of educational practice and of community life. The teacher's attitude towards community resources and industrial activity was revealed in the enthusiasm with which he accepted rural affairs as part of the school's inheritance, and his fresh outlook upon rural environment in relation to education had its effect in producing the crop of schools in the North which figure so largely in the Statistical Returns.

In most Scottish rural Counties there gradually evolved considerable opinion in favour of establishing some link between the village school and the immediate neighbourhood. The point of arousing enlightened interest in agricultural affairs through the medium of the school was accepted by the ruling classes, and the view was upheld that by some system of vocational guidance acting through directed methods an increase in efficiency might accrue not only to rural pursuits but also to the future agriculturalist as an individual. The action of the County Councils in fostering interest in the land, by their systems of monetary aid whereby facilities were afforded for the better study of agricultural industry, by the establishment of classes for teachers so that enlightened opinion might operate successfully in rural communities, proved

that in rural Scotland there existed a strong desire not only to embody in the school curriculum subjects which lent a practical interest, in contradistinction to theoretical or academic concern, but also to establish direct contact between the activities of the school and the active interests of ^{the} community.

In 1892, the County Councils of Ross, Cromarty, and Inverness awarded Grants to schools within their bounds where successes were shown at the Departmental Examinations in Agriculture as a Specific Subject. (1) This was an attempt to arouse interest in the staple industry, and it exercised direct influence upon the rising generation to considerable extent.

In 1893, the fostering influence of the County Councils in Southern Scotland was manifest in the wider interest shown in agricultural teaching throughout many schools situated within the ambit of a wide and comprehensive agricultural area. The number of pupils presented for examination in the subject during that year had increased by seventy two, (2) and this was ascribed in the Official Report to the influence of the County Councils which had provided

(1) Report of C.C.E.-- G.R.-- 1892, Page 402.

(2) Report of C.C.E.-- G.R.-- 1893, Southern Division, Pages 280 and 282.

facilities for the instruction of the schoolmasters.

In the Counties of Dumfries and Kirkcudbright the movement gained impetus through the revival of interest in rural affairs acting through local opinion especially among the farmers and ruling classes, and through knowledge of the facts and phases of rural environment imparted either at local or at University centres. (1)

In the Western Division, the County Councils were emphasising the importance of the staple rural industry and striving to extend the teaching of Agriculture in the village schools. To their influence was ascribed the fact that during the year 1893 the number of scholars presented at the examination had increased by two hundred and ninety one. (2)

The conception that rural interests should be entirely vested in the land may have been accepted without question and may have prompted opinion to the view that the educational aim in this respect was entirely vocational, a view which may have narrowed the vision, ignored to some extent the developmental aspect, and set a limit to

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- (1) Report of C.C.E.-- G.R.-- 1893, Southern Division,
Pages 280 and 282.
(2) Report of C.C.E.-- G.R.-- 1893, Western Division,
Pages 325 and 326.

educational practice.

The aim and scope of the movement appear to have been imperfectly perceived from the commencement. The direct tendency to interpret the educational purpose as bearing upon vocational guidance was implicit. The Scheme as outlined in the Code of 1883 (1) made provision for teaching Agriculture in three stages, and although within its narrow limits there is the glimpse of a social purpose beyond the vocational, it betrayed the schoolmasters by unwarily suggesting methods which probably were never intended. It was an elusive Scheme, characterised by Wallace as "half-hearted". (2) Its intention may have been to focus interest upon the principles of things in environment and not upon the things themselves, but it fell short of indicating the vital points for study, those aspects of nature and of social activity which should constitute the starting point of any continued interpretation of rural community life. Its advocacy that in the first stage consideration should be given to "the principles influencing the supply of plant food in the soil, the necessity for cultivation, and the circumstances making tillage more or less effective" failed to yield an outline complete enough to be of decis-

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- (1) Code of Regulations with Schedule and Appendix of C.C.E. 1883, Page 29, Schedule IV (8).
 (2) "Agricultural Education" by R.H. Wallace-- Trans. of Royal Socy. of Arts, Edin., 26th. March, 1888, Page 16 et seq.

ive value to the institution of a new school subject. In the second year of study, " the principles regulating the more or less perfect supply of plant food, manures, as supplemental sources of food", although of vast importance, perhaps, were entirely outwith the province of the small rural school which possessed few means of studying such principles at first hand. The third stage of the scheme, embracing " the principles regulating the growth of crops, and the variations in yield and quality", suggested a theoretical treatment, and led to bookish conceptions of principles with little or no reference to actual practice in the field. (1)

It is scarcely surprising to find that at the outset, and even in many cases during the whole period, when the aim appeared vocational, when the scheme differed little from that of the Evening Class, and when the schoolmasters who accepted it were influenced by the questionable methods of adult schools, the system of teaching in the Day classes followed the narrow limits of the textbook.

We find that in 1885, when consideration was

(1) Code of Regulations with Schedule and Appendix of C.C. E. , -- 1883, Schedule IV (8), Page 28.

III.

being given to the establishment of Agriculture as a Specific Subject in Inverary, a note appeared in the Log Book of Newtown School " to the effect that a text book had not yet been fixed upon", (1) which clearly indicates the nature of the proposed methods of instruction.

Even as late as 1891 disapproval was openly expressed regarding the methods employed in northern districts of " teaching Agriculture from class books in day schools", and the contention made officially that " the teaching should be invariably accompanied by simple experiments and illustrative materials"; (2) and in the same year, the Official Reports for the Southern Counties related that the subject laboured " under the serious disadvantage of being a practical subject taught from a text book instead of from actual manipulation of the appropriate tools and materials." (3) Affairs in the western area were in like state, and illustration of prevalent methods is revealed in the confession of a schoolmaster. "As far as I can remember", he states, "We used small text books of Blackie & Sons, separate books for each of

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- (1) Letter received from W.W.Chalmers, Newtown School, Inverary, -- 22nd. October, 1929.
(2) Report of C.C.E.-- G.R. 1891, Northern Division, Page 305.
(3) Report of C.C.E.-- G.R., 1891, Southern Division, Page 239.

the three years". (I)

This evidence demonstrates the influence of traditional methods, which lingered long in the Scottish Schools, and which gained accentuation by the insidiousness of the worst Evening Class teaching practice. The imparting of information concerning agricultural theory, the short-cut methods of the questionable text-book, with the consequent learning by rote in the shortest possible time for the purpose of earning Grants, constituted the system of agricultural education in many rural schools of the period. Environment, with its verities and aspects of village social life, was regarded mainly from the theorists' point of view, and little or no connection was made between the salient features and phases of neighbourhood and community interests and aspirations.

The worst methods were demonstrated by those schools lying in districts far removed from actual rural life. We find that in industrial areas, schoolmasters attempted to teach agriculture to the children of tradesfolk, with no expressed intention other than the gaining of Grants, and with little conception of true educational aim. The incongruity of the situation is criticised in

(I) Letter received from H. Robertson, Grammar Public School, Ayr, 17th. April, 1929.

the Official Reports;

" In 1896-97, Agriculture was professed in all the schools in the town of Dumbarton which is wholly engaged in shipbuilding, and in the Vale of Leven, where practically the sole industry is calico printing". (I)

This only reveals the tendency of the schoolmasters to suit their own preferences and to ignore the influences and content of immediate neighbourhood. In many rural districts, besides, a like tendency prevailed. In extenuation, however, it may be said that little encouragement was afforded by local school authorities; little provision was made for the accomplishment of scientific and practical performance in the schools. In many instances, the adoption of the subject in rural Day Schools was part of the policy of the local authorities to increase local revenue, and scant assistance was given to the schoolmasters to work out a practical scheme, despite the fact that the County Council and University Classes for Teachers emphasised the need for experiment and practical illustration in the work of teaching.

Here and there, however, may be discovered the

(I) Report of C.C.E.-- G.R.- 1898, Western Division, Page 485.

glimpse of progression in method, where, perhaps, through the kindlier offices of an enlightened authority, conditions were more favourable to the local school, or where, through the individual effort and zeal of the schoolmaster, ventures were launched with surprising ingenuity and insight, as in the case of the schools of Orkney, or of Aberdeenshire, where actual experiments were undertaken both in class room and in a plot of garden ground. The difficulties confronting the progressive schoolmasters were often great, but they never proved insurmountable, and the results of their efforts, although perhaps of small account from the standpoint of modern educators, were commensurate with the prevailing conditions.

In the Official Report upon the Northern Division for the year 1896, an interesting side-light is thrown upon the work of a small rural school in Kincardineshire. The efforts of the village schoolmaster of Drumwhindle were striking enough to attract the attention of the visiting Inspector of Schools, and the published report upon the school furnishes the only recorded instance where a rural school was singled out for approbation, because of the progressive methods employed. The Report states;

" The teaching in the small rural school of Drumwhindle deserves to be singled out for special mention. In addition to sound theoretical work each pupil is provided with several garden plots where he personally experiments as to the effects of different manures and their suitability for the various kinds of crops. The enthusiasm evoked shows how keenly this practical work is relished." (1)

That the true aim and the real purpose of the scheme in Agriculture were expected to appear implicit in the outline is clearly shown in the Official Reports. As early as 1885, the official conception of the subject as "specially suitable for the instruction of boys in an agricultural district" and " pre-eminently the science subject in such circumstances" (2) at once [d]emarked the place of agriculture within the circle of those educational influences which demand the acceptance of definite social values. These values were recognised as affected by the inter-play of environment on developing mind through the direct medium of observation and experiment, and more or less indirectly, perhaps, through apt illustration; and although the idea glimmered in the official mind that this

(1) Report of C.C.E.-- G.R.-- 1896, Northern Division, Page 423.

(2) Report of C.C.E.-- G.R.-- 1885, Southern Division, Page 169.

inter-play constituted a means towards the evolution of " the scientific workman trained to observe and think", (1) the possibilities of the subject as a direct developmental educational force were not entirely ignored. In spite of all attempts to foist upon rural populations a so-called "technical education", the evolution of mind and of individual capacity were recognised. It was expected that the schoolmasters would regard the subject which bore the unfortunate name of Agriculture as " a veritable science of common things", (2) " a sort of compendium of elementary science" embracing " Geology, Chemistry, Meteorology, and Mechanics", (3) a subject offering " endless object lessons of the most familiar kind". (4) But this expectation made little allowance for the fact that the rural school of the period was insufficiently equipped to undertake any valuable practical work either within or without the school, beyond the observational study of nature. The emphasis laid upon practical work and upon scientific treatment of the subject largely failed in effect by reason of the limits of

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- (1) Report of C.C.E.-- G.R.-- Southern Division, 1885, Page 169.
 (2) Report of C.C.E.-- G.R.-- 1893, Southern Division, Page 282.
 (3) Report of C.C.E.-- G.R.-- 1890, Southern Division, Page 236.
 (4) Report of C.C.E.-- G.R.-- 1891, Southern Division, Page 240.

school organisation and equipment, and adverse criticism, levelled at the work of the schoolmasters, constituted a censorious reminder to School Authorities who denied facilities to the schools and who shunned responsibility in the matter to such degree that the success of the movement was seriously impeded. If, as was apparently intended, the rural school had been equipped with facilities for actual experimental work of even a simple nature, both with respect to the necessary materials for experimentation along the lines of the simpler work attempted in the Classes for Teachers, and with respect to a plot of ground where actual practice in cultural methods could have been given, the record of achievements might have been of greater value.

The fact cannot be concealed, however, that although rural environment itself offered seasonal opportunities, the schoolmasters in many instances failed to utilise the essential features of neighbourhood and thus laid themselves open to Official criticism and to the contempt of the farming classes who generally were inclined to question the practical value of the agricultural education given in the schools. (I)

(I) Report of C.C.E.-- G.R.-- 1893, Southern Division,
Page 182.

In 1898, the Scottish Education Department gave further impetus to the systematic study of environment, offering facilities for precipitating modern developments in rural education. The desire of the Department to give greater latitude to teachers in Higher Grade Schools found expression in suggestive indications of a course of study involving scientific application of environment. The aim of such a course was centred in the habit and spirit of accurate investigation. This expressed object, the aim of all science teaching, stressed the value of creating the scientific attitude of mind, the habit of considering events scientifically, so that all after-life activity might be regulated by the critical attitudes and decisions of disciplined opinion.

The Syllabus of instruction appended to the Department's Circular 234, (I) gave opportunity for the institution of a Course of study applicable to the needs of rural schools of the Higher Grade, and it is of interest to observe that the salient features of this Course have been adopted in recent years as the basis of instruction in Advanced Division rural schools.

The aim of the Course as outlined was presumably to connect school and environment with a view, not

(I) Report Of C.C.E.-- 1899, -- Circulars and Minutes of C.C.E., Page 203 (Circular 221) and Pages 208-217, (Circular 234).

to impart facts concerning locality states or district occupations, but to create the scientific habit of mind by revealing the inter-dependence of the sciences and the inter-relation of science and Nature.

The scope of the proposed instruction covered a wide field of investigation, embracing the study of plant biology and plant chemistry, the relation of soils to rocks, the physical properties of soils, and simple physiology as an introduction to the study of farm animals. Recommendations were also given regarding systematic weather observations and regional survey work.

It was realised, however, that interpretation of environment could not be founded upon ignorance of the fundamental principles of physics and chemistry. These principles were regarded as indispensable to the successful utilisation of immediate neighbourhood. This emphasis upon the need for a basis of principles defined the methods to be employed. It was clearly shown that advancement in rural arts is founded upon the revelations of the physicist and the chemist, that the application of science principles and experimental methods is imperative if the structure of rural environment is to be fully understood. But the suggestions (I)

(I) Report of C.C.E.-- 1899-- Circulars and Minutes of C.C.E. Circular 234- Course C.

advocate experimental methods in a laboratory, supplemented by the facilities afforded by natural surroundings and by local occupations. They appear to provide for a qualis- artificial interpretation of environment. There is no mention of the problematic, of the project worked out in natural setting as we understand it today. Experimentation, as applied to an actual plot of ground where various problems arise and where projects crop up in variety with actual experience of natural conditions and difficulties , fails to find a place in the scheme. Consideration of the suggestions convinces us, however, that the intention of the promoters was worthy of wider acceptance than was given by the teaching staffs of the Higher Grade Schools of Scotland. Despite the fact that such schools located in rural areas , with suitable facilities both within and without the schoolroom, received the opportunity to experiment along new lines and to institute a system of education in Higher Departments which would have given a greater reality and purpose to learning, there appears little or no evidence to show that the movement attracted the schoolmasters in rural central schools.

Opinion was largely influenced by the institution of the Leaving Certificate Examinations, which

had changed the view to all Higher Education in Scottish Schools, diverting interest back to the traditional and academic studies. Interest in the gaining of such certificates and the popular desire for the restored type of education touched not only the Higher Grade Schools, but also the Elementary Schools. The new attitude of County Councils and of the administrators of Bequest Funds influenced the trend of higher education to a large extent. These potent influences militated against the adoption of rural Science Courses and sounded the death knell of such Specific Subjects as Agriculture.

The Northern Districts, the first to commence the teaching of Agriculture in the village schools, were the first to abandon the subject in favour of the traditional. In 1898, the tendency in the North towards the revived academic subjects was shown in the number of presentees for examination in Specific subjects. While there were 1006 presentations in the Subject of Agriculture in that year, there were also 5217 presented in Latin and 4836 in French. (1) In the previous year, it was agreed that "the unsuitability of Agriculture to the elementary school is more and more felt by teachers

(1) Report of C.C.E.-- 1898-- Northern Division- G.R.-
Page 533.

and Inspectors and the presentations in the subject are consequently happily diminishing". (1)

The Western and Southern Districts , uninfluenced by Bequest Funds, soon followed the lead of the Northern schools. Even in the year 1897 there was evidence of the decline of Agricultural teaching in the West. In 1899, when the Southern Division showed a decrease of 157 in presentations, Official opinion was expressed that " the passing away of the Specific Subjects as they were taught will be no loss to education". (2)

The general decline , ascribed to the " pressure of other subjects" (3) was significant of the reversion of educational opinion which led to the complete abandonment of the system under which Grants were allowed for the teaching of Specific Subjects. (4) The new system of Inspection of schools adopted by 1899 relegated " Agriculture to the domain of Nature Knowledge", (5) a step which ultimately led towards the establishment of modern movements.

The passing of the Specifics marked the beginning of a new and the ending of an old and question-

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- (1) Report of C.C.E.-- G.R.-- 1897- Northern Division, Page 441.
 (2) Report of C.C.E.- G.R.- 1899- Southern Division, Page 489 & 490.
 (3) Report of C.C.E.-- G.R.- 1899- Western Division, Page 530.
 (4) Report of C.C.E.-G.R.-1899- Southern Division, Page 12.
 (5) Report of C.C.E.- G.R.- 1899- Northern Div. Page 570.

able system. But whatever criticism may be levelled against the methods and results of Specific- subject teaching in Scottish schools of the period under review is tempered by circumstances inherent in the general system of education. The incidence of a prescribed individual examination demanding that in each subject of the curriculum the pupil should reach a standard of attainment in all parts of a scheme of study deliberate, precise, and narrow in detail influenced scholastic methods to considerable degree. Lack of elasticity in the scheme led to a want of elasticity in methods of teaching. It demarked an educational aim which could only be regarded as the attainment of individual passes in prescribed knowledge tests and it suggested methods and short-cuts to success which were disastrous in their immediate results and often questionable in their ultimate effects.

The subject of Agriculture, taught as a Specific subject for the purpose of increased Grant, suffered under the prevailing system of examination. The work of the rural Schoolmaster was assessed in passes and not according to real educational value. The worth of his teaching to the individual mind and to rural society was largely forgotten, and found no appraisal in the Official Schedule which constituted but a catalogue of numbers, names, and passes or failures.

It is significant that in the Log Book of Carrick Academy, Maybole, Ayrshire, prominence is given in the Report for the year 1898 to the bald fact that "the passes in Agriculture of the scholars numbered I31 and I32 on the Examination Schedule" were disallowed under Article 2I (e). (I) This entry not only shows that the subject of Agriculture was examined under the prevailing system like all other school subjects, but also that the methods of teaching it were almost dictated by the very nature of the examination itself.

Throughout the whole period the efforts of the rural schoolmaster were regulated by the Schedules of a Government Department, which allowed little room for the expression of individual opinion regarding either methods or content of scheme, by the tradition in Scottish education which assumed an attitude of finality in scholastic matters, and by the submerging influence of the general science movement, which led the way both in aim and teaching practice. These affects shaped teaching methods and directed the aims of the schoolmasters.

But whatever the faults and failures, the in-

(I) Quoted from the Log Book by Mr. A.J.Merson, Rector, Carrick Academy, 23rd. May, 1929.

stitution of Agricultural teaching constituted an attempt to relate the rural school to its environment, and the history of its achievements and of its failures remains to mark a stage in the evolution of practical education in the Scottish rural school.

Chapter Four.

Influence of The Nature Study Movement.

At the beginning of the twentieth century great changes in the Scottish educational system were introduced, changes that have been authoratively described as the most radical " in the whole system of grants, in methods of inspection, and in the rules laid down with regard to the organisation and curriculum of various departments." (I) Previous methods of estimating the worth of schools,-- the individual examination and the set date for the yearly inspection--- had resulted in the rigidity of enforced standards which impeded educational advancement and largely fostered short-cut methods and text-book ideals. The New Code of 1900, with a wonderful disregard for tradition, opened the view to a wider conception of educational influences and gave a larger freedom to the schools.

School Boards, hitherto passively interested in the organisation and curriculum of the school, had thrust upon them an increased responsibility in the matter of both. They were called upon to adapt the cur-

(I) Report of C. of C. -- G.R. 1900, Western Division, Page 519 (III).

riculum to the needs and aspirations of the community, and to provide all the material equipment necessary for the best conditions of school work. But although the imposition of such responsibility upon local governing bodies constituted a forward step of importance, it can scarcely be conceded that it remains as the outstanding feature of the new regulations. It was recognised that the onus with respect to both organisation and suitability of curriculum rested chiefly upon the teacher, and that upon him also depended the efficiency of the school under the new system. The educational influences which would affect community life were largely to be determined by his attitude and outlook upon community interests and aspirations. Under the new Code, "as under no Code before", (1) the teacher gained freedom to pursue educational advancement according to his own judgment, freedom as to organisation, classification, promotion of pupils, gradation of school work, and even, within limits, the amount of work to be professed. (2)

Hitherto, work was narrowly prescribed; the Code Schedules dictated the content of work-schemes and directed educational opinion to such extent that there

(1) Report of C. of C. -- 1900-- G.R. Western Division, Page 520.

(2) Ibid.

existed a uniformity of procedure in the schools that was scarcely to be admired.

The new Code, with a wonderful breadth of insight, prescribed nothing except upon the broadest of principles; and this freedom, this confidence in the fidelity and zeal of the teacher constituted, perhaps, the greatest impetus to the work of the modern Scottish school. It made possible the utilisation of experimental methods and opportunity for the dissemination of those influences which characterise the best teaching practice of modern times.

We can scarcely under-rate the progressiveness of the Department which thus boldly experimented in order to minimise the dangers of mechanical methods, and which introduced opportunities for initiative on the part of the educator, and for the display of self reliance on the part of the pupil, a quality sadly lacking where everything was done along fixed lines towards "examination requirements". (I)

These changes reflected largely upon rural education. They widened the scope of practice by liberating the scheme-content. They afforded opportunity to the

schoolmaster to base general education upon the foundation of community interest. This freedom, besides, was enhanced by the introduction of the subject of Nature Study, a subject of direct interest and of vital importance to rural community life. At the basis of rural occupation, it occupied a place in interest which had largely been ignored. Its introduction to the schools opened a new view to environment and enriched school life. At the end of 1900 it was asserted that "perhaps no feature of the present régime has awakened more interest and exercised a more stimulating effect, both on teachers and scholars, than the subject of Nature Study".(I)

It was anticipated that the Nature Study movement would influence the social life of Scotland by directness of contact, especially in rural districts where nature and the human uses and adaptations of natural law and principle were so closely related to the life of the community. The expressed intention of the Department was clearly defined as the acquisition of socially useful ideas through direct observation and enquiry. This intention constituted a revolt against the unrelated methods of the school, against the informational teach-

(I) Report of C. of C.-- 1900-- G.R. Southern Division, Page 497.

ing of the Elementary Department and the Text-book teaching of the Specifics.

The implications of the movement reached to the Junior and Senior Classes of the school, where it was expected that acquaintance with the salient features of neighbourhood should be directly made. (I) This expectation was not fulfilled until considerable experimentation had been attempted along the lines of varied interest and with divergent degrees of success. The subject, being new to the schools, was imperfectly comprehended. Teachers, upon whom had been thrust the responsibility of determining the details of the subject-scheme, were perplexed by vague ideas as to the nature of its content. They were called upon to adapt existing methods to meet the new and wider needs of the community or to devise new approaches to a direct knowledge of environment.

It is scarcely surprising to find that much confusion prevailed for a time, and that even undue apprehension, if not distrust, of the movement existed in the minds of teachers ill-prepared for the changes in

(I) Scotch Code-- 1900-- Article 19A, 6 (a) & 7 (a).

outlook and in required methods of teaching. (1) Individual attitude was largely determined by individual knowledge, insight, and enthusiasm, as well as by the educational traditions of the community. The teacher's outlook, hitherto narrowed by the influence of complete Official Schedules and by the accepted usages in historic school practice which presaged uniformity, failed to afford the vision necessary to meet the new circumstances and to interpret them. The greatest difficulty was experienced by those whose training had been more literary than scientific. This view of the situation was accepted in extenuation of the apparent discrepancies. (2) Failures were ascribed to the influence of the University with "its special subjects for the Entrance Examination and Competition for Bursaries as well as to the requirements of the Dick and Milne Bequest Trustees." (3)

It was evident from the beginning that the Nature Knowledge movement, which administered a powerful blow to traditional methods, was destined to meet deterrent influences in the schools. As was probably

(1) Report of C.C.E.-- G.R. 1900-- Western Division,
Page 527.

(2) Report of C.C.E.-- G.R. 1901-- Northern Division,
Page 756.

(3) Ibid.

anticipated, the chief of these influences emerged from the scheme-content. Individual schemes revealed confusion with not a little evidence of failure to appreciate the intention and the value of the subject. These schemes may be set in three distinct categories;

- I. Those which merely attempted to glorify the "Object Lesson". (1) This category was characterised by complete lack of system, of sequence, and of definition. We find the criticism made that in some schools little was accomplished that could be designated as Nature Knowledge, and that in many instances "no object or any substitute for an object" was utilised in practice, "the matter being merely hearsay repetition". (2) Where materials illustrative of the lesson were used, the selection was made with insufficient care and with a want of fore-thought. (3)

The whole instruction was (so) often entirely divorced from local phenomena and local situations. The subjects chosen for study were

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- (1) Report of C.C.E.-- G.R. 1900-- Northern Division, Page 561; Also G.R.1901-- Southern Division, Page 700.
 - (2) Report of C.C.E.--G.R. 1900-- Northern Division, Page 562.
 - (3) Report of C.C.E.--G.R. 1902-- Northern Division, Page 746.

numerous and varied. They constituted a heterogeneous collection of media designed to impart a knowledge of many things, either by methods curiously conducive to the questionable results of former days, or means ^{by}, which although less blameworthy, could scarcely be regarded as satisfying the intention of the Code. Even in the year 1906, when distinct advance was detected in progressive schools, it was stated authoritatively that in the County of Dumfries appreciation of the intention was so far lacking that indiscriminate choice of subject almost resulted in ludicrous effects. In a County rich in natural feature and in agricultural interest it was found that a lesson on an "Apple" was "sandwiched between one on an Elephant and one on a Hen", (1) and this illogical treatment was by no means confined to one school or even to one County, but was detected generally where complete ignorance of the motive underlying the movement existed.

2. Those which were specially designed to produce

(1) Report of C.C.E.-- G.R. 1900-- Western Division,
Page 396 et seq.

" "examinable results", (I) and which defeated the purpose of the subject by under-rating the education-value of the general method implied and of the particular processes inherent in the purpose. Disregarding the factors of the educative process which make for the quickening of mental activity, intellectual interest, and pleasure in achievement, the schoolmasters who adhered to such a type of scheme entirely misinterpreted the spirit of the movement, regarding success as the acquirement of a measurable quantity of information. The numerous Text-books which appeared as a result of the institution of the new subject, helped to accentuate prevalent evils and to defeat the objects desired. They offered what was often entirely unsuited to the purposes of the school and appealed to the type of teacher who aimed at the informational as distinct from the observational and experimental result.

3. Those which were too ambitious, too comprehensive, too ostentatiously scientific. (2)

 (1) Report of C.C.E.-- G.R. 1900-- Western Division,
 Page 527.

(2) Ibid.

Actuated by enthusiasm for the new subject, progressive schoolmasters in many districts adopted scientific subjects in the belief that such a preference satisfied the intention of the movement that "a distinct scientific purpose should run through the whole programme"; (1) but the preference was perhaps inspired by the influence of the decadent Specifics. In many, if not in most rural schools, where such subjects were adopted, the necessary equipment for Experimental Science was entirely lacking, and hence methods of instruction became bookish. Even although such schemes were inspired by the desire to break with tradition and to infuse the scientific spirit in the schools, they failed in so far as they substituted the formally scientific for the experimental intimately related to immediate environment. Even where Agriculture was professed, (2) the intention of the movement was not fulfilled. Although it bore a relation to community interests, its place could not be justified. The methods employed in

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- (1) Report of C.C.E.-- G.R. 1902-- Southern Division, Page 690.
 (2) Report of C.C.E.-- G.R. 1901-- Southern Division, Page 700.

teaching it could hardly be other than bookish.

The relative value of such types of scheme can only be fully realised when reference is made to the most successful experiments in the early teaching of Nature Study. Fortunately, some record remains to indicate the nature of the work accomplished in the small school of Maderty, Perthshire during the year 1900. The Official Report relates that; (I)

" The School Board have this year an experimental station for the growth of turnips. The boys in III, IV, V, and VI. took part in the cleaning of the land, in the mixing of the necessary artificial manures, saw them applied, the seed sown, visited the turnips to note the effect of the manure on brairding and growth, took part also in the dressing, measuring, and totting of the various amounts per acre for each plot, saw the bad effects of finger-and-toe, etc., on parts of the crop, and had a good introduction to what is likely to be the life work of most of them--viz., practical agriculture."

Further reference can be made to the activities of schools in the far north, a few of which have already been mentioned as noteworthy in the teaching of Agriculture under the Specific Subjects Scheme. The approach to Nature Study in these schools was mainly through Plant Form and growth, and remarkable results were apparently attained from the point of view of ob-

(I) Report of C.C.E.-- G.R. 1900, Southern Division, Page 498.

education which were destined to form the basis of modern
 servation and experiment.

" In some schools", states the Report, (1)
 the children make collections of common flowers
 in their seasons and preserve them in albums,
 and where the teacher's interests lie in this
 direction as at Rothiemay, Banffshire, Deerness
 and Stenness in Orkney, the amount of botanical
 knowledge acquired by the pupils is really as-
 tonishing. The school excursion is occasionally
 resorted to. "

Analysis of the schemes generally accept-
 ed in the schools yielded convincing evidence that there
 was great need of enlightenment and of definite knowledge
 concerning the real content of environment viewed from
 the standpoint of educational value. These needs were
 supplied mainly through the agency of Classes for Teach-
 ers to which the Colleges of Agriculture lent both in-
 terest and knowledge. We find it recorded, for example,
 that in the Southern Districts of Scotland a changed
 view of the subject gradually dawned upon rural school-
 masters as the result of the enlightenment given by the
 Edinburgh and East of Scotland College of Agriculture.
 Beginning in the year 1902, on the representation of
 the County Council of Fife, (2) the College gradually
 extended its influence and disseminated ideas of rural

(1) Report of C.C.E.-- G.R. 1901-- Northern Division,
 Page 760.

(2) Minutes of E.E.S.C.A.--Central Studies Committee,
 5th. March, 1902; Board of Governors, 26th. March,
 1902; County Work Committee, 14th. May, 1902.

education which were destined to form the basis of modern developments.

As a result of the efforts of the three Colleges of Agriculture in Scotland Nature Study teaching developed rapidly throughout the schools. In 1904 it was reported that enthusiasm, intelligence, and success characterised the work of the Southern Districts. (1) In many schools throughout the area extending from Perthshire to the Borders there was distinct evidence of progress. The chief study was Plant Life, although "bird life and rock formation" were included in the schemes of a few schools, and the practical teaching of Gardening and of Beekeeping was not unknown. A survey of the position showed that, in fact, all phases of natural history were represented. The study of insect life, for instance, was worthy of special notice in the Burgh School of Selkirk, from which "radiated a zeal for entomology which it would be difficult to match in any other district in Scotland." (2)

In the Report of 1904 upon the schools of the Western Division details were given of the methods employed in the small school of Polharrow, Kirkcudbright-

(1) Report of C.C.E.-- G.R. 1904-- Southern Division, Page 367 & 368.

(2) Report of C.C.E.-- G.R. 1905-- Southern Division, Page 250.

shire;

" A day book is kept in which are entered each day noteworthy things observed on the way to and from school, along with the name of the observer. Children all make collections of flowers, grasses, etc. and mount them. The popular name and date of finding it are entered." (1)

In Northern Districts, progress was somewhat retarded. Even at date 1905 criticism was officially made that while some admirable work was being done in particular instances, many of the schools still adhered to Text-book teaching of a rigid and vicious nature, regardless of progressive ideas and the suitability of immediate neighbourhood as a fruitful field of enquiry and experiment. (2)

The work of the Agricultural Colleges received greater impetus when Supplementary Courses were established in Scottish schools in the year 1903.(3) These Courses were framed for pupils " who, having reached a certain well-defined stage of general education" (4) would not enter upon the study of specifically Secondary subjects. In reviewing the Elementary School Curriculum as a whole, the Scottish Education Department was alive to the possibilities of creating new interests

(1) Report of C.C.E.--G.R. 1904-- Western Division, Page 386.

(2) Report of C.C.E.-- G.R. 1905, --Northern Division, Page 334.

(3) Scotch Code, 1903-Art. 21. (4) Circular 374, 16th Feb. 1903.

and of giving stimulus to pupils likely to leave school at the minimum age allowed by the Education (Scotland) Act of 1901. Recognising the need for differentiation between types of mind and between types of school, the Department conceded a difference in aim and in purpose with a corresponding difference in the subjects which should be included in the scheme of instruction. Opinion had awakened to the necessity for parallelism in Courses corresponding to parallelism in mind groups. The system of education which would satisfy the needs of one mind group was insufficient for the mental activities of others; and each group demanded consideration as an essential condition of educational progress.

It seemed possible to give new interest to previous school studies, to enhance their value, by placing in the fore-front their bearing upon the probable practical requirements of the after-life of the child. Certain well-defined groups of occupations were considered as the bases of advanced education in Elementary schools, and the types of Courses which centred round such occupations were intended to give definition and a sense of reality to the work of the schools. (†)

The special instruction relative to rural life and industry was based upon Agriculture and Horticulture, the Nature Study of earlier school-life being

thus amplified and adapted to the needs of the future agriculturalist. It was pointed out that the aim should be the training of observation and the exercise of the reasoning powers of the child, and not the memorising of facts relating to agriculture. Nor was it intended that the instruction given should supplant the knowledge which can only be acquired by daily practice of rural occupations. The practical education which was in view suggested an end of vital importance not only to the farmer and the farm labourer, but also to those whose interests lay elsewhere. The scientific methods which a reasonable acceptance of this aim necessarily provoked, were regarded as of value in after life whatever the future occupation of the child might be. This insistence upon the educational as opposed to the vocational aspect of rural education marked the starting point in the modern developments and may be regarded as the outstanding feature of the Nature Study movement.

The suggested Course provided for a variety of simple scientific studies related to immediate neighbourhood. These were focussed upon the rocks and soils of the district, the local crops, the weeds and insect pests, of common notice, the facts of plant nutrition and growth, and the relationship of air, water, and soil to both vegetable and animal life.

In order that the aim might be attained through practical methods directly related to environment, School Gardens were recommended not as adjuncts to formal lessons, but as starting points to enquiry and investigation of neighbourhood. It was realised that as such Gardens had proved of educational value in the isolated areas in which they had been already established, lending reality to study and truth to experiment, they might succeed in directing teaching practice along the desired lines throughout the rural schools of Scotland. The School Garden had become an established feature of the rural school in America and on the Continent, and its reputed success as a potent factor in creating the relationship between school and society was regarded as sufficient urge to its acceptance in rural areas in Scotland.

The factors which militated against the success of the Supplementary Course for Rural Schools during a period of several years were similar to those which impeded the progress of the whole Nature Study Movement. The perverted views of the schoolmasters, the want of appreciation of the purpose and scope of the Course, and insufficiency of knowledge concerning rural affairs, led to disastrous results in the rural school. We find it

related that in rural areas far removed from commercial and industrial life, resort was made to the Commercial Course designed for urban schools, or to studies incongruously compounded of matters of rural interest and of those belonging properly to a city environment.

In many schools of the North, the Commercial Course was followed in entirety with a total disregard for the incongruity of the situation. (1) Village schools situated in the midst of quiet agricultural surroundings, where the stress of commercial competition was unknown, indulged such subjects as Book-keeping and Business Procedure of a kind least likely to influence the commercial life of a country town or the commercial practice of the farming community.

In Southern schools, even after the Edinburgh and East of Scotland College of Agriculture had widened its influence to meet the demands of rural education, a like situation existed, the Commercial Course being frequently adopted where the educational needs of the district suggested the institution of the Rural Course. (2)

In the schools of the West there was also a

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- (1) Report of C.C.E.-- G.R. 1904-- Northern Division, Page 426.
 (2) Report of C.C.E.--G.R. 1907-- Southern Division, Page 383.

preponderance of Commercial Courses. In the Official Report upon the schools of the district, issued in 1904, regret was expressed that so few attempts had been made by country teachers to adopt the special Course for Rural Schools, "not only upon grounds purely educational, but also on grounds closely connected with the serious social problem of the emigration of rural population into the large towns." (1) The Report for the year 1907 states with reference to the work of Supplementary Courses in a prescribed area;

"In Argyllshire there are approximately 36 Commercial Courses, 16 more or less Rural Courses, 2 Navigation Courses, and 5 Courses of an industrial character. It is evident that in this County the number of Rural and Navigation Courses could be largely increased." (2)

The criticisms of the Official Reports are tempered, however, by the admission that the state of the Supplementary Course in rural schools as depicted was not entirely due to the schoolmasters. In some cases at least, choice of the Commercial Course was influenced by the parsimonious policy of School Boards, (3) who withheld facilities for practical work, refusing to pro-

(1) Report of C.C.E.-- G.R. 1904-- Western Division, Page 393.

(2) Report of C.C.E.-- G.R. 1907-- Western Division, Page 456.

(3) Report of C.C.E.-- G.R. 1906-- Southern Division, Page 361 et seq.

vide garden plots and the few necessary tools on the ground of initial cost. (1)

The parsimony of School Managers induced some schoolmasters to adopt a Course comprising both rural and commercial subjects, (2) a practice which implied the neglect of practical activities in the school. The adoption of such make-shift Courses constituted a compromise, which led to both confusion of aim and of method. The theoretical study of commerce was compensated for by observational work of a disconnected and illogical kind, and the rural aspect of the Course was apt to be neglected so that so-called individual study might be done by the aid of newspapers and statistical reports, which at best could only supply details of market prices and of shipping.

Even where serious attempts were made to experiment along the lines indicated by the suggested Rural Course, the results were characterised by extreme variability. In the Report upon the work done in the County of Perth during the year 1903- 1904, (3) emphasis was given to the fact that, although signs of observational experience were evident, little actual experi-

(1) Report of C.C.E.-- G.R. 1907-- Southern Division, Page 383.

(2) Report of C.C.E.-- G.R. 1905-- Northern Division, Page 336; G.R. 1907-- Southern Division, Page 387.

(3) Report of C.C.E.-- G.R. 1904-- So. Div. Page 375.

mental work had been attempted in agriculture and horticulture. At one school, it is related, "flower beds were kept"; at two schools "observations were made on bees". (1)

A considered review of the position as it existed during the early stages in the Counties of Scotland from Perthshire to the Borders was submitted in 1904 by Mr. Bruce of the Edinburgh and East of Scotland College of Agriculture to his County Work Committee.

"I have had considerable opportunity during the last two years," he reported, "in conducting Nature Knowledge Classes, and in the performance of my work in the Counties, of getting insight as to what is being done in schools. I have given the matter pretty full consideration, and have formed the opinion that, provided this matter is taken up systematically, the College Staff might do a great deal of useful work in turning the disconnected efforts of local schools into fruitful channels.

In the meantime all the schools are spending some time on Nature Knowledge teaching; Natural History is their happy hunting ground.

The College might influence the direction of these studies so that they might be conducted on objects not only of rural but of economic interest." (2)

In calling attention to misdirection of effort in the schools and to the economic aspect of

(1) Report of C.C.E.-- G.R. 1904-- Southern Division, Page 375.

(2) Minutes of E.E.S.C.A-- Memorandum on Staff Arrangements-- County Work Committee, 21st. September, 1904.

of practical education, the Report was probably instrumental in changing the outlook of the Agricultural College upon rural education. Hitherto, interest had been centred upon Nature Knowledge in the schools through the influence of the College. Large numbers of teachers had attended the Classes intended for the purpose, (1) but the instruction given did not supply the direct needs of rural schoolmasters who designed to adopt the Rural Course in their schools. In the Report upon the Teachers' Vacation Course, 1903, it is stated that seventy eight hours of instruction had been given in Nature Knowledge, including excursions. Landsurveying, which formed the practical subject of the Course, had little bearing upon the work of the Elementary school. (2)

The economic interest of practical education in rural areas, to which Mr. Bruce referred in his Report, was considered essential in any scheme by the Scotch Education Department when ; in 1906, they suggested the adoption of the Recommendations of the Departmental Committee on Fruit Culture. (3) In Paragraph 21 (4) of the Recommendations the point was stressed

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- (1) Minutes of E.E.S.C.A.-- Sub-Committee on Teachers' Classes-- 9th. February, 1904.
 - (2) Minutes of E.E.S.C.A.-- Central Studies Committee-- 23rd. September, 1903.
 - (3) Minutes of E.E.S.C.A.-- Sub-Committee on Teachers' Classes-- 14th. February, 1906.

that it appeared essential to teach Horticulture in Scottish Elementary schools serving rural populations, and that such schools should have good gardens attached to them.

These suggestions completely altered the nature of the Teachers' Courses in the Southern District. Instruction in Nature Study became more adequately related to the needs of the rural school and to the communities interested in the land. Horticulture as a subject of school instruction became part of the Course, and provision was made for practical experience at the School of Gardening, Corstorphine. (1)

This new influence had the desired effect of inducing rural schoolmasters to institute the practical study of Gardening in their schools, and valuable assistance was given by County Organisers employed by the College of Agriculture in the matter of formation of garden plots and the carrying out of actual experiments.

By June, 1908, Mr. Bruce was able to report that he had received many communications regarding the projected establishment of school gardens within the College area. (2)

In other districts of Scotland interest had

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- (1) Minutes of E.E.S.C.A.-- Sub- Committee on Teachers' Classes--- 14th. February, 1906.
 Minutes of E.E.S.C.A.-- Central Studies Committee, - 26th. June, 1907.
- (2) Minutes of E.E.S.C.A.-- County Com.- 24th. June, 1908.

also been aroused. The Report on the Western Division for the year 1907 clearly shows the general attitude towards the new movement;

"There can, however, be no question that the all-important industry of the rural districts is Agriculture, and the crux is how to bring the instruction given to the older pupils at the Supplementary Course Stage into direct contact with it. During the past year the lack of any direct relation between the teaching of the schools and the future employment of boys and girls who are to spend their lives in country districts is a question which has been again and again pressed on my attention; and a motion was brought up by a prominent member of the Ayrshire County Council that the attention of the Department should be drawn to this clamant need in connection with the teaching of our rural schools."

"If the instruction is to be of any real value it must be practical, and, as far as the boys are concerned, probably the best side from which it can be approached is that of a properly equipped school garden".

"The Course, which I understand your Lordships intend to adopt, namely, to place funds at the disposal of the several Agricultural Colleges, enabling them to send into each county one or more experts, who are to get into touch with the young farmers, and with the teachers, and to give assistance in the formation of properly equipped gardens at the rural schools, and instruction to the teachers as to their management, will probably result at an early date in better planned and better taught rural Supplementary Courses." (I)

In the same year, the Counties of Ross and Inverness had enlisted the services of the resident

(I) Report of C.C.E.-- G.R. 1907-- Western Division,
Page 456 et seq.

lecturer from the College of Agriculture, Aberdeen. He was engaged upon the work of organising the instruction given in rural subjects, and attempting to create a coherent system of education from the disconnected matter of ~~of~~ the existing Rural Courses. (I)

The consideration of the extension of the County Work of the Colleges of Agriculture, already referred to , and suggested by the Education Department in 1908, marked a further step in the evolution of practical education in rural schools. The purpose of the extended enterprise was to bring the education of the schools into close touch with rural life and occupation. To effect unity of purpose and a certain uniformity of procedure in the schools, as a corrective to disconnected and diverse effort, the Colleges of Agriculture furnished details regarding possible developments in the work of school Gardening . The general nature of the proposed procedure can be observed in the Memorandum on Extension of County Work, issued by the Edinburgh and East of Scotland College .

(I) Report of C.C.E-- G.R. 1907-- Northern Division,
Page 488.

was "The School Garden approved by the College deals with both Agricultural and Horticultural crops. Five or six plots, one pole each, are devoted to a series of farm crops which are to be grown in rotation. Three or four plots (or more, according to the number of boys in class) are to be laid out with a selection of kitchen-garden vegetables; and in a complete garden there would be a plot devoted to fruit trees and bushes. The boys are to do all the work connected with these plots. They will be taught measuring of land, tillage, manures, mixing and sowing, most suitable manures for various crops, seed and seeding, growing crops, harvesting, weights, measures and yields per acre-- as well as the cultivation of vegetables and fruit. It is hoped that in this way the principles of Agriculture and Horticulture will be taught in a practical and useful manner." (1) school gardens had been established

The effects of the stimulus given by the Education Department and of the guidance afforded by the Colleges of Agriculture can be traced in the work of the Scottish rural schools during the whole period of development. The trace of progress can be detected most clearly, perhaps, in the Southern areas. In 1905, the County of Fife had school gardens established at Gate-side and Flisk. (2) In the western district, the Rural Course was almost wholly confined to Argyllshire where practical instruction in the form of School Gardening

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- (1) Minutes of E.E.S.C.A-- Advisory Committee--11th. November, 1908.
 (2) Report of C.C.E.-- G.R. 1905-- Southern Division, Page 258.

was in operation at Easdale, Claggan (Morven), Tayvallich, Skipness, Clachan, and Achencorvie. A Rural Course on practical lines existed also at Bishopton (Erskine) in Renfrewshire. (1)

In Northern schools during the same year, although the agricultural aspect of rural education was prominent in the Rural Course, opportunities for practical application of principles were almost entirely lacking. (2)

By 1907, school gardens had been established in several schools in the Borders, at Forgan in Fife-shire, and at Buchanan, Lanarkshire. The little village school at Ednam possessed a cow and taught practical dairying. Woodwork was also taught at Ednam as well as at Broughton and West Linton. (3)

Northern schools developed the practical side of the Rural Course slowly. This is borne out by the Report of 1907;

" The establishment of school gardens in the divisions is now beginning to demand the attention of school authorities and others interested in the development of education on its more practical side; and although little more than a start has been made so far as actual gardening work by the scholars themselves is concerned, much earnest atten-

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- (1) Report of C.C.E.-- G.R. 1905-- Western Division, Page 302.
 (2) Report of C.C.E.-- G.R. 1905-- Northern Division, Page 339.
 (3) Report of C.C.E.--G.R.1907--So. Div. Pages 377, 384,385.

tion is now being devoted by agricultural and horticultural experts, landowners, and others skilled in rural pursuits, to devise ways and means of establishing and equipping school gardens on thoroughly practical lines, so that the scholars may be able to derive the maximum of educational benefit from them. The school gardens which have been established at Aberdeen Grammar School, Dingwall Academy, Lochee Ancrum Road Public School, Carmyllie (East) Public School, Grange Cross Roads Public School, Croy Clava Public School and several others are already showing how much can be done in this direction." (1)

In 1908 there was a large demand for the establishment of school gardens in the Southern area. Twenty six schools had consulted the Edinburgh and East of Scotland College of Agriculture on the matter of school Gardening. (2) The Official Report on the work of the Division for the year states that " a steady effort has been made by H.M. Inspectors to institute school gardens at suitable schools. In Edinburgh district there are five". (3)

" The practical work which has shown most progress this session is gardening. There are now over twenty school gardens in this district. It may be of some assistance to give some details of the garden which has been laid out at Lauder Public School. The garden measures 26x13 yards. The main plot is div-

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- (1) Report of C.C.E.-- G.R. 1907-- Northern Division, Page 489.
 (2) ~~Report~~ Minutes of E.E.S.C.A.-- County Committee-- Page 28th. October, 1908.
 (3) Report of C.C.E.-- G.R. 1908-- Southern Division, Page 39.

ided up into eight plots; five of these, each 30 by 9 feet, are agricultural and are to be cultivated on the rotation usual to the district; the three others, each 30 by 8 feet, are horticultural, and are devoted to the cultivation of vegetables and flowers. In addition there is a nursery and a herbaceous border.

Various artificial manures have been used. "

" I should also like to give a description of the garden at Roxburgh Public School. The credit of this garden is due entirely to the teacher who has not had the assistance of a representative of the East of Scotland College of Agriculture.

In this case the garden covers an area of 264 sq. yards. It is 1 chain long divided into 10 plots. Each plot is subdivided into plots, each containing 4 sq. yds. Three lots of six plots each are given up to farm crops; three more, containing 15 plots, are devoted to the cultivation of garden vegetables. The rest is mainly occupied by flowers; but two plots have been planted with lucerne. In the farm crops, two sets of plots exemplify two different rotations. Six plots are utilised for the cultivation of the useful grasses, two are planted with flax, and one with rye.

This garden deserves high praise. It has been formed out of the playground; part of the ground had to be made; - Finally it has been fenced and finished off with a gate, the whole of this work being done by the boys." (I)

In Northern schools, with increase in the number of school gardens there was a corresponding widening of influence upon local social life. The Official Report for 1908 asserts that the teaching of the

schools had spread to the home where attempts were being made to apply in the cottage garden those principles and methods which formed the basis of school garden practice. (1)

In some Northern districts, however, undue importance appears to have been given to the agricultural aspect of the subject, and the criticisms made upon the nature of the experiments attempted in such districts clearly show the Official attitude.

"At one of the Carmyllie schools the garden consists entirely of a miniature farm.-- This element in the scheme appears to me open to serious objection. The farm is conducted on too limited a scale and under conditions too artificial to be truly experimental, while the observational benefits could be quite as well obtained from the fields in the neighbourhood; it further fails to afford the pupils sufficient opportunities for continuous and continuously interesting work. An even more serious, because more general, objection is that not all the boys of the rural schools are to be engaged in farming or farm work, whereas the school training ought to be beneficial to all. ----- In my opinion the main benefit to be derived from the school garden springs from its cultural and humanising influence, and not from its severely practical utility."

"Rotation of crops, usually a rotation of five years, is too long an experiment for a boy in an elementary school to carry out. Moreover, cropping the school

(1) Report of C.C.E.-- G.R. 1908-- Northern Division, Page 29.

(3) Report of C.C.E.-- G.R. 1909-- Western Division, Page 31.

(4) Ibid.

" garden with farm crops would leave nothing for the boys to do while the crops are growing. Further, there is not sufficient variety of plant life and cultural processes for the purpose of Nature Study. " (1)

By the year 1909, fifty school gardens had been established in the Southern Counties of Scotland. (2) School gardening was beginning to be appreciated at its proper value in many rural districts and serious consideration was being given to the educational importance of the country environment.

In the Western Counties, where the movement showed evidence of distinct progress, the influence of the schools had permeated the rural home. School gardens were located at Mearns, Houston, Erskine, Neilston, Undercraig, Kilchoaman, Clachan, Taynuilt, Creich, Portnahaven. (3) At the latter school the experiments merited the approval of the District Inspector.

" After much labour a piece of ground adjoining the school was prepared and cultivated. Excellent crops of vegetables were produced, with the result that a local interest in gardening was created, and the cottagers, who before never thought of growing anything but potatoes, vied with one another in rearing a variety of vegetables." (4)

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- (1) Report of C.C.E.-- G.R. 1908-- Northern Division, Pages 29 & 30.
 (2) Minutes of E.E.S.C.A.-- County Committee-- 13th. October, 1909.
 (3) Report of C.C.E.-- G.R. 1909-- Western Division, Page 31.
 (4) Ibid.

In 1909, there were eighteen school gardens in Argyllshire and six in Renfrewshire. Those of Argyll had a stimulating effect upon the crofting system, affording insight upon newer methods of cultivation, and suggesting the adoption of vegetable growing in place of crops hitherto cultivated. (I)

The progress in Northern districts, although comparatively slow, was steady. Under the guidance of the Northern College of Agriculture the movement spread to the outposts of the North and influenced the rural schools, giving reality to school life and an enlivened interest to rural affairs. Schoolmasters, imbued with the spirit of the movement, sought to gain qualification to teach the new Nature Study by attending Vacation Classes, and thus were the direct means of the new influence upon the rural social life of the North.

The state of the movement can be detected in the Official Report upon the Northern Division submitted in the year 1909.

"At Huntly a considerable area of ground has been set aside for this purpose, and I anticipate that the starting of this garden will have an important influence in the whole neighbourhood. The Huntly Board, progressive

in all matters, is showing the example in this interesting development of Supplementary Class work. In Orkney a grant was paid last session for a school garden at South Sandwick Public School. In Shetland successful gardens have been started at Bressay and Sandwick".

"On a general survey it may be said that the character of the instruction in this subject is still tentative, and both consultation and co-operation on the part of Agricultural authorities, School Boards, teachers, and H.M. Inspectors will be requisite in order to secure uniformity of type (so far as this is desirable) in this department of school work. It will be necessary, for example, to determine whether, and to what extent, the teaching should be mainly agricultural or horticultural. Manifestly in most cases the area of operation within the school grounds is too limited to secure a profitable study of the growth of cereals, and the proximity of farms in most rural districts supplies a more favourable field for observation. On the other hand, the predominance of the horticultural type of garden hinders the application of the instruction to agricultural operations, with which the future farm labourer may usefully be familiarised at a fairly early stage." (I)

"In the study of plant life the school garden is found invaluable, but, where this is not available, teachers are beginning to make excellent use of window boxes, etc., their zeal and ingenuity in overcoming natural and incidental disadvantages being indeed worthy of high praise. Only in one or two cases, however, has the hesitation to utilise corners and strips along school walls been overcome. The disciplinary value of this use is not generally appreciated. Nature Study excursions are unfortunately rare; but teachers are not always to blame for this. Those of

them who would welcome this innovation are a little afraid of the prevailing popular notion that education must be confined to books and the four walls of a class room. This prejudice threatened School Gardening in one or two cases; parents protested against 'wasting the childrens' time at weeding and digging'. They fancied they saw here the return of the days when the parish dominie sent the 'duffer' to dig the garden, while he and his 'lad o' pairts' scanned their Vergil. These were, however, but isolated cases of opposition, which a little tactful explanation soon removed.

At present, School Gardening is one of the most hopeful branches of practical instruction in this district, not only as an aid to Nature Study but from the point of view of material usefulness. Last year I referred to the spread of cottage gardening among the crofting population as a direct result of the experience gained at school by senior boys; and I am glad to be able to report, from observation of individual cases, further advance in the past session. The home gardening, more especially in its initial stages, is as a rule supervised by the head teachers and the exhibition of produce, which is beginning to be a special feature of local Flower Shows, is a strong stimulus to effort. This latter point I respectfully urge upon the attention of all interested in rural home life. The Congested Districts Board within their area continue to aid in a most sensible way the practice of school gardening, primarily for its effect on the homes of the pupils. This year again they have promised a supply of seeds and plants suitable to the respective districts; and the conditions they attach, viz. that the older boys should be encouraged to apply at their homes the school instruction in the subject, and that the head teacher should send in a short report to them at the end of the season, seem eminently reasonable." (I)

(I) Report of C.C.E.-- G.R. 1909-- Northern Division,
Page 34 et seq.

(II) Report of C.C.E.-- 1914-1915-- Table 2, Appendix VII
Page 59.

(III) Report of C.C.E.-- 1914-1915-- Page 1.

The history of practical education in Scottish rural schools during the years 1908 till 1914 reveals an increasing interest and enthusiasm for the teaching of Horticulture. The number of schools which possessed garden ground and taught practical gardening to the older pupils under Article 2I (b) of the Code is shown in the following table; (I)

	Number of Schools.	Number of Pupils.
1908-1909.	50	940
1909-1910.	140	2596
1910-1911.	250	4401
1911-1912.	380	6500
1912-1913.	497	9127
1913-1914.	571	9989

During the period of the Great War educational organisation was seriously disturbed. More than one seventh of the total male teachers of Scotland were withdrawn for military service in the first year of operations. (2) The want of qualified teachers, especially in remote districts, and the evils attendant upon war conditions generally, had a disturbing effect upon the development of rural education. The great demand for juvenile labour, more especially in Highland and Northern areas, prompted methods of curtailment in the normal

(1) Report of C.C.E.-- 1914-1915-- Table 2, Appendix vii Page 59.

(2) Report of C.C.E.--1914-1915--- Page 4.

period of school life in order that children might be employed on the land. Indiscriminate awards of exemption from school attendance accounted for diminution in the number of scholars in many rural districts.

In spite of these disturbing factors, the progress of practical education in rural Scotland was little affected. In the year 1914- 1915, six hundred and thirty one schools professed to teach Horticulture , the total number of pupils being eleven thousand, two hundred and eleven.(1)In the following year the number of schools had increased by eleven, and the decrease of 386 pupils shown in the Official Returns is attributable to the exemption granted to those older boys required for farm work. (2) A further increase in the number of rural schools which taught School Gardening is recorded for the year 1916- 1917, with a further decrease in the number of scholars. (3)

The increase in the number of schools participating in the movement may be partly attributable to the fact that in many rural schools the subject of Woodwork was abandoned and School gardening adopted in order to serve the double purpose of education and of food production. (4)

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- {1} Report of C.C.E.--- 1916-1917-- Page 9.
 - {2} Report of C.C.E.--- 1916-1917-- Page 9.
 - {3} Report of C.C.E.--- 1917-1918-- Page 11.
 - {4} Ibid, Page 5.

With the gradual return to more normal conditions following the cessation of hostilities, practical education in rural areas progressed. The prospect of complete reorganisation under the new County Education Authorities established as a result of the Education (Scotland) Act of 1918 gave wider view to the possibilities of the rural school. The extension of administrative areas had the effect of creating facilities for practical work in the schools which in many cases had been formerly denied; and although by the year 1920 the assumption of the powers of Education Authorities had just been effected, the outlook for the rural school was considerably extended.

It only remained for the new Authorities to attack the problem of rural education according to the suggestions of the Scottish Education Department, (I) and make more intensive and complete the system of practical education which had been already established in the Supplementary Division of the school.

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- (I) Circular Issued by the Scottish Education Department, No. 44, dated 13th. December, 1921.

Chapter Five.

Modern Developments.

The changes foreshadowed by the Scottish Education Department, (1) particularly with regard to the organisation of post-primary education, have already exerted a far-reaching influence upon the work of the Scottish rural school. The institution of Advanced Division Courses, in place of those designed for the former Supplementary Classes, has given distinct direction to the educational system. The emphasis laid upon the provision of groups of parallel Courses particularly adapted to different community needs has focussed attention upon the educational advantages which may accrue from study of immediate neighbourhood. The inclusion of such practical subjects as Gardening, Agriculture, and Dairying, within the scheme, (2) reveals the intended direction of practical education in the rural school.

Under the influence of such direction, education in rural districts has assumed greater importance and has been afforded a greater latitude both with regard to teaching methods and to contact with community interests and aspirations. In the teaching of practical subjects new light has been thrown upon the purpose of education.

(1) Circular 44-- Scottish Education Department.

(2) Code of Regulations for Day Schools in Scotland, 1923, Appendix No. I, First Schedule, 4 (a), Page 9.

ation and upon its relation to the school environment. A stage in development has been reached when, through its immediate contacts, the educational system may influence more largely rural life and industry, setting up new standards, creating new conceptions regarding the true nature and meaning not only of rural industry, but also of rural neighbourhood.

Under the guidance of the Scottish Education Department, Authorities have instituted Courses which include the subjects of Horticulture and Agriculture, viewed from a new stand-point. The school gardening of former years has advanced along the lines of scientific enquiry in those Counties where facilities have been afforded, assuming a position of importance in the scheme of rural education which hitherto it could not claim. The subject of Agriculture, which in the past suffered largely, and was only a subsidiary aid to teaching practice in the rural school, has taken its place as a means of practical and scientific study; and in its extension, as in that of Horticulture, the Colleges of Agriculture have rendered valuable assistance. The proposals which they have made have given a lead to the conduct of practical education in rural Scotland, and their untiring efforts to raise the standard of rural life are reflected in the work of the schools and in the communit-

ies which they serve. The nature of their interest in rural education may be observed in the Report of a Conference held in the Edinburgh and East of Scotland College of Agriculture in 1924. (I) The Report states;

" The Committee is of opinion that the time is ripe for bringing education in rural schools into more intimate relationship with country life, and the feeling was expressed that the unsatisfactory nature of the present education was an important factor in rural depopulation. An attempt should be made to provide a more useful type of education.

The Committee recommended that Courses in Rural Science should be provided in as many schools as possible in the area, and that the College should co-operate with Education Authorities in framing suitable Courses, the Courses to be given at Advanced schools provided with proper equipment for the teaching of science. "

The Rural Course, with its practical bias and its application of scientific principles, has been established in many rural districts. In Counties mainly rural schools have been equipped with necessary tools and appliances for out-door work and also with suitable apparatus for in-door experiments which are carried out either in class room or in a room specially fitted up for laboratory purposes. As a result of survey, we find that Rural Courses-- which include both out-door and indoor experimental studies-- have been established in

(I) Minutes of E. & E.S.C.A.-- 29th. February, 1924.

most of the rural Counties of Scotland, while School Gardening is carried on in all Counties except two.

The following Table shows the disposition;

County.	School Gardening.	Rural Courses.
Argyll.	21	--
Berwick.	16	10
Caithness.	11	4
Dumfries.	35	3
East Lothian.	5	1
Forfar.	14	25
Inverness.	44	36
Kincardine.	10	13
Kirkcudbright.	3	6
Moray.	6	14
Nairn.	--	2
Orkney.	5	15
Peebles.	5	2
Roxburgh.	16	5
Shetland.	32	5
Sutherland.	-	1
Wigtown.	6	11

In Counties mainly industrial, such as Selkirk, Renfrew, and Lanark, no Rural Courses have been established, although the two latter Counties possess eleven and thirty school gardens respectively.

A considerable number of Rural Courses exist in the Counties which are partly rural and partly industrial. These are in operation in the following Counties;

County.	School Gardening.	Rural Courses.
Ayrshire.	7	-
Banff.	--	18
Bute.	2	--
Clackmannan.	4	--

County.	School Gardening.	Rural Courses.
Dumbarton.	14	--
Fife.	26	11
Midlothian.	1	1
Perth.	45	17
Stirling.	4	1
West Lothian.	2	6
		(1)

The establishment of Rural Courses in Counties entirely rural in character has been attended by considerable difficulty. Differences exist even between such Counties as to the nature of the obstacles to progress, but generally the deterrent influences centre round the school itself, its location and its population. Where schools are situated in comparative isolation by reason of natural barriers to direct and easy communication, and where school population is scattered and relatively small, the difficulties of providing advanced education of a practical kind are great. Paucity of numbers on the school roll creates a situation which is difficult to overcome. The necessary grouping of children according to differences in age and in attainment, and the distribution of school work- periods for the teaching of general and practical subjects complicate the organisation of the small rural school to such extent that opportunity for systematic advanced in-

(1) Replies to Questionnaire, received from Education Authorities.

struction can scarcely be afforded to any great degree. The limitations are determined largely by the number and the calibre of the teaching staff.

In spite of such obstacles, however, a surprising amount of useful work is being accomplished even in two and three teacher schools; but successful efforts are rarely observed except where the head-teacher has gained the necessary qualification to instruct in rural pursuits and in the principles underlying them, and where he has a genuine love for the country, an interest in rural life and occupation, an understanding of immediate environment, and an enthusiasm for the uplifting of village society. Such teachers are receiving encouragement in working out a solution for advanced education in the isolated school, and already signs are not wanting that the experiments in course of trial have a value both from the educational and from the social standpoint.

Realisation of the difficulties inherent in the system of rural education has compelled school Authorities to seek a solution of the problem along other lines. Where communication between village schools is comparatively direct, itinerant teachers of rural subjects are being employed to serve scattered areas. But there are Counties where such a solution is either entirely impossible or extremely difficult to achieve. Both from the financial and from the educational point of view

it is scarcely feasible for such Counties to employ peripatetic teachers. It has been stated, for instance, that in Argyllshire " the difficulty of employing such teachers would be very great owing to the long distance which teachers would require to travel in going from school to school. It is estimated that two thirds of the teachers' time would be taken up in travelling unless short intensive Courses of several weeks' duration were arranged for." (I)

Where itinerant teachers are employed-- and such are few in broad Scotland-- the work of the Rural school in its practical aspect appears to be successful. The teachers are usually Graduates or Diplomees in Agriculture qualified under Chapter VI of the Regulations for the Training of Teachers. They visit isolated schools at fixed times and their work may be devoted to outdoor occupations or to laboratory or class room experiments, if facilities are given for such . Their value to the rural school is largely determined by their outlook upon school life and community interests, and by the nature of the professional training which they have received. As the number of such teachers is comparatively small, it is impossible to estimate their true worth from the educational standpoint; but considerable doubt exists as to

(I) Reply to Questionnaire-- County of Argyll-- 21st. November, 1929, Para. 8.

whether the employment of peripatetic teachers generally will solve the problem for the isolated school. There are no doubt distinct advantages to be gained from the periodic visits of an expert . There are factors relating to personality, to changes in school method and subject matter, and to knowledge which is specialised, which may have an important bearing upon the tone and upon the general life of the school and its neighbourhood. The provision of opportunities which under normal circumstances is impossible , and the relief afforded to the schoolmasters by the addition of teaching power, constitute advantages which can scarcely be ignored.

The disadvantages inherent in the system are no less important. The training of the specialist teacher may militate against his success in the school. Suffering from the effects of his specialism, he may become circumscribed and lose sight of the broader view of education which reveals the aim as the development of an individual through social relations, and not the training of a potential farm worker. His methods may bear him too much towards vocationalism of a narrow kind; his outlook may only be towards the farm and the field, and not towards the individual and the society to which he belongs. Such a possibility has been recently observed and steps may soon be taken to provide a professional training adequate to the needs of the teacher of rural pursuits,

broader in its scope, more cultural in its purpose, and more profitable in its application. (I)

It is one of the misfortunes of the itinerant teacher that he loses the impetus which comes from daily intercourse with the child and with the general working of the school, that he cannot fully understand what is involved in atmosphere and in the corporate life of the school community. His touch upon the lives of the pupils is so light that it may be entirely failing in effect, and as a bird of passage, flitting from school to school, he may seldom appreciate the relative value of the influence of village life upon the village school. In his condition of comparative isolation, he may see only that part of school life and activity over which he has immediate control.

In his work the peripatetic teacher is limited by factors over which he has no command. The setting of a fixed and unfluctuating period for his visit has distinct disadvantages. The facts of weather condition and of ground state, always serious factors in any scheme of outdoor occupations, must be contended with, and although indoor experimentation may be carried on, opportunities for correct-time working of land, for sowing and for

(I) Reprint No XII-- Rural Subjects-- Scottish Council For Research in Education Publications-- University of London Press-- 1931-- Page 6.

other occupations which are largely determined by season, are often missed, so that sequence in work may be at variance with actual practice in field or garden. Under ideal conditions, schemes for the rural school should allow for elasticity in Time Table so that pressing operations may be carried out timeously. This has an educational value. It trains to situation-values, to method, and to opportune activity.

In some Counties of Scotland, the problem of time-opportunity at the disposal of the village schoolmaster has been solved temporarily by enlisting the assistance of the County Organisers employed by the Colleges of Agriculture. These officials, in some cases, not only act in an advisory capacity, but also carry out the actual instruction in the schools. In Caithness, where Courses have been established in two or three-teacher schools, a definite agreement has been made with the North of Scotland College of Agriculture by which the services of the local organiser and his assistant are placed at the disposal of the schools for a certain period each week. (I) In some Counties in the South, a like arrangement exists. In others, although

(I) Reply to Questionnaire-- County of Caithness- 26th. November, 1929.

in the initial stages local organisers acted as teachers of agriculture and horticulture in the schools, the arrangement has been abandoned. This has occurred as the result of the provision made by Education Authorities for the direct employment of qualified teachers recognised under Chapter VI of the Regulations for the Training of teachers to instruct pupils in Agriculture and Horticulture. Such teachers, in some cases, have received appointments upon the permanent staff of the schools, but they have been employed so far only in the larger schools where a three year's Course in Advanced Division Classes has been definitely established. The Counties of West Lothian and Dumfries have, perhaps, been foremost in adopting this arrangement. In all other instances, the teachers are employed upon a peripatetic basis.

The gradual substitution of County organisers by qualified teachers in the south has been carried out also in pursuance of the policy of the Edinburgh and East of Scotland College of Agriculture, which, in its advocacy of the establishment of what have been designated as Rural Science Courses, agreed that whatever assistance might be given to the schools in the matter of instructors, could only be regarded as temporary, and that Education Authorities were expected to undertake the work of teaching whenever suitable arrangements re-

garding staff should be completed. (I)

As the function of the Colleges of Agriculture appears to be of an organising and advisory nature as far as the schools are concerned rather than the provision of instructors, it is probable that reliance will be placed upon school Authorities in other districts to make arrangements for the carrying on of the work at present organised and taught by County organisers.

In some Counties a system of centralisation, either complete or partial, has been instituted in order to provide for country communities facilities of equal value to those which pertain in the industrial or town area. Pupils from a prescribed district are collected at a recognised central school which possesses the equipment and staff required for the carrying out of both outdoor and indoor activities. At such centres, instruction is given in all subjects of the curriculum, including English, Mathematics, and Art, as well as in the practical subjects of agriculture, horticulture, and Handwork, where complete centralisation obtains. Such centres are intended only for pupils who have reached a

(I) Minutes of E.E.S.C.A. 29th. February, 1924.

standard of attainment in general education usually measured by ability to pass a Control or Qualifying Examination at the average age of twelve years.

In the case of partial centralisation, the general procedure followed is that the ordinary subjects of the curriculum are studied at the local or home school, attendance at the centre being made at fixed times during the school week for the purpose of instruction in special subjects, which may include either indoor or outdoor experimental work or handwork of some kind. In some isolated instances, indoor studies are pursued at the central school, the outdoor work in garden being done at the local school. The latter procedure is open to criticism. It seems more advantageous that the practical work should be done at the centre, if there is to be any relation established between outdoor and indoor experimentation, between the practical and its scientific explanation, and if the maximum educational advantage is to be gained. To separate practice from theory, to isolate outdoor from indoor activities, to divorce the underlying principles from their direct application, is to detract considerably from the value of both. There are points in immediate environment, of time-separation, and of differences in the outlook of the teachers concerned, if different individuals are employed in teaching parts of a related Course. There

may exist a lack of co-ordination where separate teachers are unaware of the attitude and the work of each other.

The whole problem of centralisation has confronted Education Authorities in several of the Scottish rural Counties, but few solutions have been completed. The situations are diverse and the facilities and necessities variable. In some cases, perhaps, centralisation schemes form a practicable procedure; in others, they are unnecessary and undesirable. (1) Where they might be desirable they are sometimes impracticable. The erection of any system of centralisation is conditioned by the consideration of educational evolution in any area. Where the events in the educational life of a community have marked distinct stages in the development of its powers of adaptation and assimilation, a system of centralisation may be deemed expedient if all other factors are favourable. The principle which should underlie all schemes of centralisation is that expressed by the Official Report of 1923, (2) It depends upon recognition of the distinction between "or-

(1) Report of C.C.E-- G.R. 1923-- Southern Division, Page 9.

(2) Ibid, Page 10.

ganic development and mechanical contrivance". Every scheme of centralisation has to contend against the attitude of traditional mind, vested interests, and "troublesome facts of geography and human perversity". (I) There are points in immediate environment which, if ignored, may not only obstruct policy but defeat a scheme based entirely upon arbitrary notions of centralisation. Geographical position, the situation of the schools, their distances from each other, the incidence of natural barriers to direct communication, render travelling inconvenient and difficult in many instances. Lack of transport facilities, the expense involved, the loss of time due to transportation, and the unavoidable fatigue, are factors which cannot be ignored.

But where centralisation schemes are justified from both educational and economic points of view, there are distinct compensations. These are educational and moral in effect. The larger experience and wider outlook and knowledge gained by the child through separation from smaller groups of children of lesser age, attainments, and vision, through the influence of a new environment and of larger-group communication, the incentive given by similar age and group-mind activities, are

advantages of vast importance. Such grouping allows the isolated child, who may be more or less isolated in the home-group or in the circumscribed farm-community, an opportunity of meeting on equality with those groups of children who have come under the influence of other interests, an opportunity of working as a member of a group of pupils of equal age and mental stage towards a definite end. This has a direct social effect. It stimulates to greater activity and leads to co-operative work of a high value. The pupils learn to think and act as a group under new and stimulating circumstances, and gain opportunity to express their tendencies towards organisation and leadership, which are all-important in education.

The instances of centralisation recorded are more or less due to the incidence of ready facilities in the matter of transport and of an apt geographical situation. In some Counties, centres have been established in villages linked by direct communication to small feeder schools, and they serve agricultural communities within an area of considerable extent. In others, the direction of centralisation has been towards the village or Burgh where the rural aspect of environment is influenced by the industrial situation.

In certain Northern Counties and in areas lying within the Southern Uplands, centralisation is either impossible or is attended by difficulties which may outweigh the educational advantages. Geographical situation in many districts of vast extent limits the usefulness if not the possibility of grouping. In Orkney and Shetland the water-ways which separate the isles make centralisation impracticable. In Sutherlandshire, grouping can only be adopted where arrangements have been made for boarding the pupils in the locality of the central school. This has been attempted at Golspie, where a large Advanced Division Centre has been established at the Technical School. The extent of the County, which is sixty miles square, and the nature of the configuration, have dictated the necessity for such a type of centralisation as the only feasible system, especially in view of the fact that few teachers in the rural schools within the County are sufficiently qualified to teach the subjects of the modern Rural Course. (1)

Where communications between schools is comparatively easy, centres are located and provision is made for the award of Post-Qualifying Bursaries, so that pupils may have opportunity to attend central schools. In Caithness, a County mainly rural in character, there

are three centres, the largest at Halkirk, and the others at Dunbeath and Latheron. These schools are fully equipped for practical and experimental work. Bursaries may be allowed to pupils who elect to attend at the centre, but no arrangements are made for conveyance, the mode of transport being left to individual choice. (1)

In Morayshire, where the school population reaches approximately seven thousand, there are seven schools conducted under the Secondary School Code, all well situated to serve the immediate needs of the County. These "absorb a considerable number of pupils who in ordinary course would be Advanced Division pupils of Primary schools". On the other hand, there are nearly twenty rural schools-- two, three, four, five, and six-teacher schools--- where an Advanced Division Rural Course is in operation. Partial centralisation does not exist in the County, but a modified system of complete centralisation has been set up, by which pupils are at liberty to migrate to schools in which a complete two or three year's Course is professed. Conveyance to the centre is by cycle or by motor Bus, for both of which an allowance is given. (2)

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- (1) Reply to Questionnaire-- County of Caithness,-- 26th. November, 1929.
- (2) Reply to Questionnaire-- County of Moray-- 18th. November, 1929.

In Fifeshire, a system of complete centralisation exists at the market town of Cupar. This is the centre of a large agricultural district with a sugar beet factory established in its midst. Within the area considerable interest is displayed in Horticulture. The school is fully equipped for out-door and indoor experimental work, the teaching of which is undertaken by a member of the permanent staff who has the assistance of a Lecturer from the Edinburgh and East of Scotland College of Agriculture.

Within the County there are also four centres at least which serve areas of from four to five miles in extent. In some few cases, partial centralisation schemes are in operation. Pupils are centralised either for handwork or for indoor experimental work.

In West Lothian, a County of both agricultural and industrial interests, there are six Rural Course Centres, five of which are situated in villages mainly industrial in character, although in the surrounding neighbourhood agricultural work is pursued. These five Centres, -- Winchburgh, Blackburn, Whitburn, Fauldhouse, and Blackridge, --- are fully equipped for the carrying out of Three Year Courses in Rural Science. Winchburgh School has the services of a permanent teacher qualified to teach Agriculture under Chapter VI of the Regul-

ations for the Training of Teachers. The other schools have the assistance of a peripatetic teacher of rural subjects and of a teacher of handwork. The sixth Centre, situated at South Queensferry, lies in the midst of an agricultural area and on the borders of a small Burgh Town. It professes a full Three Year's Course in Rural Subjects. The permanent staff of the school undertake the teaching of all subjects of the Course. This may be regarded as the only school within the County which, lying in a truly agricultural district, has established a full Course in Rural Subjects, there being no centre at the County Town of Linlithgow, a market town situated in the midst of a large agricultural area.

In Dumbartonshire five centres have been established to serve the needs of districts four or five miles in radius. To these schools pupils travel either by bus or by train.

In Dumfriesshire there are two Centres, at Lochmaben and at Wallace Hall Academy, Closeburn. In the school of Lochmaben a three Year's Course is in operation, and attempts have been made to co-operate with the College of Agriculture of the West of Scotland and with local farmers. The experiments outlined for Wallace Hall Academy are only in the initial stages. A Three Year's Course has been commenced under a qualified permanent staff, and the developments outlined fore-

shadow the extension of the Course to a period of four or five years. The projected scheme is intended to serve the requirements of the County and, if need be, those of neighbouring shires as well.

At the school there is ample accommodation. Ground to the extent of several acres is available for the purposes of out-door experimental work, and it is anticipated that the acreage at disposal of the school will be utilised for experiments in agriculture and horticulture, the main mechanical operations being carried out by hired adult labour.

The success of the system depends upon popular acceptance of the value and need for such a Centre within the limits of a County largely agricultural. The scheme is only in its initial stages. So far it has not created enthusiasm which would indicate immediate success to any great extent.

Where centralisation is inoperative in Counties and districts, attempts have been made to institute Rural Courses in the scattered village schools. In these, the teaching of practical subjects is either undertaken by the Head teacher or by an itinerant teacher. In the Counties of Scotland which may be regarded as mainly rural in character, there are very few peripatetic teachers, so that in most cases the teaching is done by the Head teacher. In Orkney, where fifteen Rural Courses are in operation, the work is being done by the

Head teachers of two and three-teacher schools, two of whom are women. The schools are equipped for simple indoor experimental work, and attached to each is an ample garden. The work in Rural Science is modern and progressive. (1) In Shetland, which has five Rural Courses in active operation, and in Invernesshire, which has thirty six, there are no itinerant teachers. Practical subjects are taught by the schoolmasters, and interest in the work of the Course is sustained by the methods adopted to relate the school to environment. (2)

In Kincardineshire there are thirteen small schools in which Rural Courses have been established, and instruction in all subjects of the Course is given by the Head teacher. In Forfarshire, the work is largely in the hands of the permanent staffs of the schools, one itinerant teacher being employed in the County. In Roxburghshire, Kirkcudbrightshire, and Wigtownshire, the small schools are served by peripatetic teachers.

The success of the work done in the small rural school is mostly attributable to the village schoolmaster, and it would appear that where factors of time-opportunity and of organisation permit, the class teacher is most

(1) Reply to Questionnaire-- County of Orkney-- 1929.

(2) Reply to Questionnaire-- Counties of Shetland and Inverness-- 1929.

(3) Reply to Questionnaire-- Counties of Kincardine, Forfar, Roxburgh, Kirkcudbright, Wigtown,-- 1929.

suitable to the work. Where the local schoolmaster has a love for the country, an interest in rural life and activities, an understanding of immediate neighbourhood, its peculiarities of type both with regard to individuals and to occupations, and an enthusiasm for the uplifting of village society, the task of relating the school to the rural community is probably safe in his hands. Many rural schoolmasters have sought to qualify as teachers of practical subjects; many have acquired a knowledge of the best modern methods of teaching science. Most have had practical experience of outdoor experimental work. Where such qualifications and such knowledge have been gained, the work of the village school shows progress.

Modern conceptions of rural education from its practical aspect have focussed attention upon the facts of environment, especially upon the occupational activities of the rural community. These facts have emerged in a new light and have given rise to definitely related school activities which are embraced under the unfortunate name of "Rural Science". This new direction of school interest is now regarded as giving definite value to environment as an educational force; it is intended that the related studies should become the means of natural development, as far as that is possible. The component parts of the subject named "Rural Science" are generally taken to be

agriculture, horticulture, dairying, and poultry-keeping, although the number of schools which give instruction in the latter two subjects ^{is} are relatively small. In 1928, there were only two schools in Scotland where dairying was taught, and six where instruction in poultry - keeping was carried on. (I) The main direction of practical work is towards agriculture and horticulture. Practical experiments and out-door instruction are carried out in the school garden, and class-room or laboratory exercises are given so that the relationship of practice to scientific principle may be successfully demonstrated.

Considerable confusion appears to have arisen as a result of the general or embracing name "Rural Science". Originally intended to include all rural subjects of a practical nature along with their scientific explanations, arrived at through direct observation and experiment, the name has appeared misleading. As a result of misconceptions too much stress has been laid upon compartmenting, so that the subject is often divided into sections which seem to be relatively disconnected. The names " Gardening" and "Agriculture" have been applied to the out-door work and "Rural Science" to the indoor or laboratory exercises. This has led to a certain divorcement between practice and

theory, and has confused impressions regarding the aim and the scope of the subject. It would appear that work out of doors should be as intimately connected with science as work done within the class-room or the laboratory, that the outdoor and the indoor activities should form a unity in direction and in result, and that the garden ground should be regarded as a laboratory to which the indoor laboratory is a supplement. Besides, the work of observation and experiment should not be confined to either the garden or the class-room, but should be extended to embrace the larger environment. From this point of view the division of the subject into parts with names which may convey wrong impressions regarding the aim and the scope is subject to criticism.

The schemes of work which have been compiled may have been partly responsible for subject-compartmenting. In some instances, they appear to be unduly biassed towards agriculture, especially where the influence of the Agricultural College is pronounced. Where College Lecturers are employed in the actual teaching of Rural Science, we find stress laid upon agriculture or horticulture, according to individual interest, and where two teachers, one interested in agriculture and one in horticulture, are engaged in the work of any one school, there is apt to be overlapping. Where the underlying principles are identical, it does not appear important

to consider over-much the type of crop to be grown. The point at issue is whether it is expedient to develop interests along the narrow lines of occupational activity and neglect the larger influences and ideals, whether it is more important to educate for life or for a livelihood. With the altered conditions of life and of social environment a new consciousness has evolved, a consciousness that the development of the community depends largely upon the ideals of the educational system, apart from any reference to the probable future occupation of the child. This consciousness has illumined the truth that the education of the school should not only constitute a factor in increasing the child's respect for rural life and interests, but should become the means of inculcating tendencies towards appreciation of all the facts of the social order. Those children who by birth and by tradition are intimately related to the larger issues of environment, require an influence, an impetus, which shall help to conserve and amplify existing experience. It has to be remembered that tradition and custom play a vital part in the lives of the average rural child, that the influence of parental mind-states, of parental occupation and interest bear upon child experience. Children know something of their natural and social environment. They know something of rural occupations, of ploughing, of seed-time, and harvest, something of plant life and of the

many phases of nature lying open to their inspection. The child appreciates his environment to a limited extent, and with the developmentt of capacity that appreciation may grow. It is a moot point, however, whether the direction of the educational system should be towards training for an agricultural occupation. As the result of a Questionnaire it has been found that schoolmasters are generally agreed that the aim of their teaching in Rural Science is entirely educational, but it appears questionable whether the methods generally adopted in the rural school will achieve the desired result to any great extent. There seems to be a tendency to ignore or to forget the aim when actual experiments are being carried out, a tendency to follow the methods and to aspire to the results of the Agricultural Colleges. This is no doubt due to misconception of the elusive term "rural bias".

There are two assumptions underlying all ideas regarding an education with a rural bias. The first lies in the belief that agricultural work is likely to be obtainable within the school area and that pursuit of the occupation is desirable both for the individual and for the rural community. The second is covert in the conception that by inculcating a love for the country, an abiding interest in rural life, that by fixity of habit and of ideals, inducement may be strong enough to conserve rural community life. Such assumptions do not allow for economic

forces and the factor of individual capacity. The former may counteract the influence which the school exerts towards checking the exodus from country districts, while the latter may betray itself in the determined attitude of the individual to forsake the country for the larger environment of the city. It is questionable whether migration to the towns can be easily arrested in an age when facilities for intercourse with a wider environment are readily available and when knowledge of city life and affairs is so rapidly spread. In some districts of Scotland it would appear that under the altered conditions of farm labour and with the introduction of machinery the demand for farm workers is on the decline. In others, the tendency is for both boys and girls to migrate to neighbouring towns where employment is obtainable with prospect of relatively better social conditions.

In such circumstances the school cannot hope to arrest migration, and all efforts made through the medium of instruction in agriculture must fail. The work of the school must be directed towards a preparation for life, and not for farm labour. The rural school must supply an education which, although it may utilise the facts of neighbourhood, is a general education evolving an alert, interested, resourceful being who by virtue of his preparation for complete living shall be able to apply his

knowledge and skill in whatever sphere of activity he may ultimately be placed. The question of aim must be settled by reference to individual capacity. If we can be certain that the education given will be as profitable for the child destined by circumstances or by choice for work in the town or in the industrial area as for the future farm worker, the adoption of a system of education which is narrowly biassed is justifiable.

If it is allowed that general capacity and not specific ability is inherited, it seems contrary to ideas of natural development to attempt to train a child vocationally before the period of adolescence is reached, at which time he begins to reveal his natural bent or inclination. It is only at this stage in his development that the school can help to reveal his natural trend, and at the most the influence of the school is greatest where the effect of school work issues in correct guidance. Organised training or teaching in vocational subjects must be delayed until the child has reached the stage when he is able to try out his powers in that chosen direction of interest which may determine the line of his future work and usefulness.

To introduce vocational education in the elementary school is to presuppose either equality of capacity or inclination fixed before the adolescent stage is reached.

We are dealing with children of from twelve to fifteen years of age, the period of upheaval and reconstruction, when lack of co-ordination exists in bodily and mental life. Impulsive nature and simple adjustment to environment have largely been abandoned. The individual is now pursuing new experiments, and the spirit of adventure has awakened in him through the developing force of conation. The world of ideas reveals value situations which become new incentives to action, and where these situations are false, the corrective influence of the school is important. Such influence can scarcely operate effectively if the school offers only the means of training for an occupation which proves unsuitable to the inclinations and the capacity of the individual.

Where schemes are founded upon this acceptance of the aim, the rural school will perform its true function. Reference to immediate environment, the adoption of the basic facts of natural and social life as potent influences in the development of an individual as distinct from a labourer in the fields, will enhance the value of education, and besides, will give to the isolated community group an infusion of interest and enlightenment which makes for progress.

Chapter Six.

The Work of Individual Schools.

The progress of practical education in rural Scotland may be estimated by the nature of the experiments undertaken in three types of school. The first type includes two or three-teacher schools which lie in positions of comparative isolation, serving the needs of scattered areas. Among these may be singled out two schools which present features of different interest. Both are two-teacher schools. The one, (I) situated approximately eight miles from a County Town, has an average Roll of fifty one, which does not fluctuate to any large extent owing to the fact that the rural population is relatively stable. Thirty years ago the school stood in the midst of thriving crofts and small farms, and the school population was therefore much larger than it is today. But the tendency to absorb the croft in the larger farm as opportunity occurs has robbed the neighbourhood of the wider individual prosperity which it once enjoyed. It is reported that during the past seven years four crofts have disappeared. The entire school neighbourhood is still agricult-

(I) Clenterty School, Banffshire.

ural, however, and the school population ultimately finds employment in rural pursuits.

This little school works under difficulties which may be typical of many two-teacher schools in Scotland. Enrolment of pupils at the age of five years is often impossible owing to the distance between the home and the school and to the lack of good roads. These factors have an effect upon the length of the child's school life. It is found that the amount of time spent in the highest class of the school varies from six months to two years. This circumstance makes it difficult for any scheme of higher work to be carried out successfully. In 1929, the school had an Advanced Division Class of only nine pupils-- four boys and five girls .

The Rural Science Course, which is entirely in the hands of the schoolmaster, is two-fold in nature, comprising experimental work within and without the school building. Facilities are available for developing indoor work of an interesting nature, and there is a garden attached to the school, one tenth of an acre in extent. The soil, a heavy clay with a distinct hard pan, which necessitates the use of a pick when double-digging is in progress, is nevertheless fertile, although inclined to be late and cold. This garden has been in use since 1910

when a Course in School Gardening was introduced. Since 1924 a scheme of Rural Science has been in operation. The original scheme, drafted by the North of Scotland College of Agriculture, has been modified as the result of experience, in order to overcome the difficulties which arise when two distinct sections of the scheme are attempted in one year. These difficulties are mainly due to the system of group-teaching which exists in so small a school. The Headmaster is responsible for the conduct of younger classes as well as for the teaching of the few Advanced Division pupils, and when practical subjects are introduced in which younger pupils can take no real part, the difficulty of carrying on two distinct sections of indoor work on a higher standard is increased. The position as it existed before modification of the scheme was effected is fitly described in the reply to a Questionnaire submitted to the present schoolmaster.

"I myself have given a lesson in Ist. Year work to three pupils, and after they had commenced to write their notes, have given a 2nd. Year lesson to one pupil."

Such a situation, created by the incidence of low Roll, suggested the advisability of dividing the whole two Year's Course into two sections, A and B, so that during the period of two years the whole scheme might be overtaken with the greatest possible advantage to the

pupil and with least inconvenience to the general routine of the school.

The original scheme allowed for a Course of instruction divided into four sections according to a seasonal arrangement. The nature and the value of the modifications which were made to suit local conditions can be detected in the outline given below.

First Year Course-- Indoor work-- as originally drafted.

September and October(Period of Harvest-- I6 lessons)

- | | | |
|-----|---|-----------|
| A. | 1. Elementary Botany of Potato Plant--- | 2 lessons |
| A. | 2. Elementary Botany of oat & Barley Plants- | 4 lessons |
| B. | 3. Examination of most of the cultivated Clover and Pasture-grass seeds, etc. | 6 lessons |
| A&B | 4. Use and usage of kitchen and Physical Balances.--- | I lesson |

A balance of three lessons --left for the development of any special aspect of the work.

November, December, January, February (Period of Soil and Plant rest and of soil working-- 28 lessons)

- | | | |
|----|--|-----------|
| A. | 1. Expansion caused by heat; thermometers; Fahrenheit and Centigrade----- | 2 lessons |
| A. | 2. Physical effects of frost on soil-- | I lesson |
| A. | 3. Air-pressure; Suction pump and Force pump----- | 2 lessons |
| A. | 4. Barometers; weather charts.----- | 2 lessons |
| A. | 5. Soils and sub-soils, preliminary examination.----- | I lesson |
| A. | 6. Physical condition of soils and sub-soils-- finding water content and organic content.----- | 4 lessons |
| A. | 7. Rough mechanical analysis of soils and sub-soils.----- | I lesson |
| A. | 8. Texture of soil as influenced by water. | I lesson |
| B. | 9. Examination of the Green Plant-- Water and organic matter content.----- | 2 lessons |
| A. | 10. Examination of branches in winter.-- | 4 lessons |

Balance of lessons left for development of special aspects of the work.

March and April (Period of Sowing and Early Growth--

12 lessons.

- | | | |
|----|--|-----------|
| B. | 1. Examination of the structure of seeds.--- | 3 lessons |
| B. | 2. Examination of the young growing plant-- | 1 lesson |
| B. | 3. Examination of the growing seedling,
root hairs etc.----- | 1 lesson |
| B. | 4. Seed testing; purity; fertility per-
centage.----- | 1 lesson |
| B. | 5. Solubility and insolubility, filtra-
tion, evaporation etc. Rate of action
of artificial manures related to
solubility.----- | 3 lessons |

Balance of three lessons.

May and June (Period of rapid growth, of thinning of

Plants and of conservation of soil moisture--10 lessons.

- | | | |
|----|--|-----------|
| A. | 1. Air-space in soils related to size of particles-- | 1 lesson |
| A. | 2. Film moisture----- | 1 lesson. |
| A. | 3. Capillarity; surface tension---- | 1 lesson. |
| A. | 4. Rate and period of rise of water in
various soils.----- | 1 lesson. |
| A. | 5. Evaporation from soil; wind-breaks;
rolling and surface cultivation----- | 1 lesson. |
| A. | 6. Path of water in soil summarised.---- | 1 lesson. |
| A. | 7. Evaporation from soils related to
treatment of surface----- | 1 lesson. |
| B. | 8. Test for dissolved matter in water
taken from soil; test for dissolved
matter in liquid manure----- | 1 lesson. |

Balance of two lessons.

Second Year.

September and October

- | | | |
|----|---|-----------|
| B. | 1. Collection of insect pests in dormant stage
commenced----- | |
| B. | 2. Percentage moisture in seeds; effect of
freezing, heating; effect of dryness of
seed on keeping qualities----- | 2 lessons |

May and June--- (10 lessons)

- A. 3. Study of the atmosphere and of combustion; oxidation; hard and soft waters--8 lessons
- A. 4. Expansion of gases; convection currents; ventilation of stables, potato-pits----- 2 lessons

Balance of three lessons.

November, December, January, February.--(28 lessons.)

- A. 1. Friction; greasing and oiling of farm machinery.----- 1 lesson.
- A. 2. Rusting; care of implements----- 2 lessons
- A. 3. Structure of stems, bark, sapwood, heartwood, annual rings,----- 3 lessons
- A. 4. Methods of healing of wounds on plants; bark scars, saw scars, cuttings and grafts.----- 4 lessons
- A. 5. Examination of fruit trees; principles of pruning.----- 4 lessons
- B. 6. Effect of snow on soil temperature---- 1 lesson
- A. 7. Water in soil apart from film moisture; drainage.----- 2 lessons
- B. 8. Study of chalk, limestone, quicklime, slaked lime----- 2 lessons
- B. 9. Physical effects of lime on clay soil-- 1 lesson
- B. 10. Test for need of lime in soil----- 1 lesson

Balance of seven lessons.

March and April---(12 lessons.)

- B.I. Specific Heat. Relation to temperature of wet and dry soils----- 2 lessons
- B. 2. Latent Heat; relation to temperature of air and soil----- 2 lessons
- B. 3. Absorption and radiation of heat with particular reference to the soil--- 2 lessons
- B. 4. Osmosis----- 2 lessons
- B. 5. The path of ascending moisture in plants----- 2 lessons

Balance of two lessons.

May and June--- (10 lessons)

B.	1. Transpiration of leaves-----	2 lessons
B.	2. Carbon assimilation-----	1 lesson
B.	3. The plant as a storer of energy; starch in green plants-----	2 lessons
B.	4. Study of starch-----	1 lesson
B.	5. The green plant as a user of energy; respiration and oxidation-----	2 lessons
B.	6. The descending path of soluble food material from leaves -----	1 lesson

Balance of one lesson.

The letters A and B denote the two sections of the modified Course.

The aim of the Course, as described in the words of the schoolmaster, "is to give the children some idea of the nature of plant life; its growth; development; the necessary food and the different requirements necessary to produce good results. It is hoped to get the children interested in the subject, carry home some information and get the parents to improve their methods if necessary." But this aim, although essentially social, does not appear to have been attained. The appeal has not been strong enough to induce the young farm worker to continue the study of environment under direction of the Evening School to any great extent. Daily work in the fields has dulled interest in the science of rural occupations. Even among adults the attitude towards the acquirement of further knowledge of rural affairs and towards improvement in farm practice is decidedly phlegmatic. The majority of the

parents are conservative in ideas. They have seldom been far from the locality of their homes, and their outlook is narrow and circumscribed. There are children in the school, over twelve years of age, who have never travelled in a train.

In a small school of this type the obstacles to progress, lying both within and without the school, are many and great. The situation of the school, its size, its place within a community of easy and slow habits, determine the nature and the scope of the experiments which may be carried out with any degree of success. It is questionable if, in such a neighbourhood, any bias towards vocational practice can influence community life as is expected, and the question remains whether it is not advisable to set the work of the small rural school upon a broader basis, having a reference to environment by all means, but with a lesser vocational intention.

The second school which may be selected as a type of the two-teacher school is situated in a rural district of Angus. (I) It has a school population of only forty. Ninety per cent of the pupils are the children of agricultural workers and eight per cent those of craftsmen intimately connected with farm activities, e.g. blacksmiths etc. It is reckoned that at least eighty

(I) Aldbar School, Angus.

five per cent of the present pupils will follow agricultural pursuits, so that the environment of the school and the social attitude have dictated the adoption of a Rural Science Course. The Course, instituted in 1924, is at present taught to two boys in the Advanced Division. The scheme was compiled by the present schoolmaster and no outstanding changes have been made in "aim, outlook, or methods" since the scheme was approved. The object of the Course, as given by the schoolmaster, is to induce the pupils to take an intelligent interest in what appertains to all branches of agricultural work, and to produce as a result a scientific farm worker. But it is questionable if this expression of the aim is a just one when consideration is given to the actual content of the scheme. Provision has been made for a two Year's Course in Pure Science and in Gardening, and the details are centred mainly round the geology of the soil, plant life, and meteorology, while a special feature of the work concerns the study of insect and of pond life. Such interests in school life would tend to produce more than a scientific worker in the fields, and it would appear that there is a true educational purpose underlying the scheme.

The difficulties which confront the schoolmaster are similar to those which act as deterrents to progress

in the small school of Clenterty, although the hindrances may be somewhat removed by the nature of the scheme and by the provision made, through the employment of a peripatetic teacher of science, for assistance in carrying out the experiment.

The position of the three-teacher school is not dissimilar to that of the lesser sized school. The difficulties are alike in magnitude and the removal of all obstacles to progress is being faced by the zealous schoolmaster. The methods employed are exemplified in the case of two schools situated in rural districts furth of the Lowlands yet widely set apart.

The little school of Ordiquhill in the County of Banff supplies the educational needs of a rural population consisting of farm workers, crofters, and rural craftsmen. It has a Roll which varies from seventy to eighty, and the number of pupils in the Advanced Division of the school reached a total of fourteen in the year 1929 -- three boys and five girls in the First Year Class, and two boys and four girls in the Second.

The scheme in Rural Science, begun in 1926 and carried out entirely by the schoolmaster, has undergone complete change. The intention at the present time is to observe the mean between Rural Science and Pure Science,

but relief is given to the academic aspect of the scheme by the inclusion of some reference to plant study and to insect life.

Experience in actual working of the scheme has shown, however, that it is generally impossible to overtake the work as outlined for a complete two Year's Course owing to the fact that the schoolmaster is responsible for the teaching of other classes, and an attempt to surmount the difficulty has been made by breaking through the recognised Time Table of the school.

One of the most interesting experiments in rural education, from the point of view of the small school, is that of Banchory-Devenick school in the County of Kincardine. The work attempted may be regarded, perhaps, as typical of the best in the small isolated rural district. The school is a three-teacher one serving an agricultural area and probably eighty per cent of the male school population is absorbed in agricultural labour or in pursuits nearly allied. The average Roll reaches ninety or one hundred pupils of which about twenty are pupils in the Advanced Division Classes undergoing a Two Year's Course of instruction. The work of the Division is almost entirely undertaken by the schoolmaster, who carries on a complete Course in Rural Science. In this latter subject the girls have an equal part with the boys except

that they do not undertake outdoor work. They receive instruction in Cookery while the boys are engaged in the school garden.

The experiment in teaching Rural Science was initiated some ten years ago through the enthusiasm of the schoolmaster who perceived the value of relating the little school to its immediate environment and who was bold enough to widen the Course so as to arouse the interest and to supply the needs of the rural girl. Introduced as a substitute for the ordinary science Course of the former Supplementary Class, the scheme was intended to provide a change in method rather than a change of content, the contention being that through consideration of immediate environment and by means of continued reference to its various aspects, scientific principles might be taught with a bearing upon life and with a subsequent enlargement of interest and understanding.

To this end the order of the experiments and observations was determined by the incidence of the out-door farm work of which the lessons were intended to supply the scientific explanation. "For instance, the laying of drains in a neighbouring field would be used as an introduction to lessons on Pore Space, Soil Ventilation, etc.,; rolling in Spring suggested lessons in Capillarity and Surface Tension; ploughing led to lessons on Soil."

From the outset the experiments were grouped round (1) The Plant Organism (root, stem, leaf, etc.); (2) Plant Environment (soil, weather, etc.); (3) Typical Rural Occupations (milking, building, etc.). Such grouping was found convenient and was continued throughout, although new experiments were continually being introduced. A point was made of retaining in the scheme those experiments which required the simplest apparatus, and which could with advantage be carried out in the school class-room. Early experience was utilised to provide focus for the separate branches of the subject so that a better division of the work between First and Second Years might be obtained. At first it was found that some parts of the subject were receiving disproportionate treatment, and corrective measures were adopted.

When the scheme was begun the lack of apparatus proved a difficulty. There were only a few odds and ends of science equipment in the school, so that much ingenuity had to be used by both teacher and pupils to supply what was necessary for the successful working of experiments.

As a result of the interest shown by the Director of Education in the venture, apparatus was eventually supplied and the little school has now two balances, thermometers, some chemicals, and other equipment sufficient for carrying on the work successfully. The position at present is that there is no difficulty in securing additions to the

existing stock.

In 1928, the Banchory-Devenick scheme was superseded by that compiled by the North of Scotland College of Agriculture, and although it has been found that this scheme is adequate especially in the matter of outdoor work which previously had been treated on former Horticultural lines in the school, it is thought that it emphasises the agricultural aspect unduly. Opinion has also been expressed that the imposition of this scheme, which is in use throughout the schools of the County and elsewhere, has created a certain tendency to uniformity that is not altogether desirable. The view of the schoolmaster has been aptly summed up in these words;

"I think it was Lord Oxford who said, 'To know what you must do yourself, and what you can let others do for you, is one of the secrets of efficiency'."

"The uniform scheme makes no allowances (for teaching power and special local circumstances); it only makes demands. Rural Science is a wide subject, and at the present stage of its development, I am all for allowing, even at the expense of some symmetry, any teacher who has a specialised knowledge in some branch to follow out that line in some detail. I am thinking of such lines as Meteorology, adulteration of milk, Mendelism, etc."

The fact that the scheme now in general use

appears unduly biassed may be ascribed to the interpretation which has been given to environment. The point that seems to have been overlooked is that rural environment has undergone considerable change within recent times. It has been expanded by the introduction of modern appliances and by the results of science research and invention. The outlook of the people even in the district of Banchory-Devenick has been widened. Ideas have been modified and old customs have even disappeared.

"In the short time I have been here", writes the schoolmaster, "The motor-bicycle and the bus have worked a veritable revolution. Many influences which one used to associate almost exclusively with city life have become, for good or ill, part of our rural environment. I was amused to hear at a function in the school the other night a person ruefully remarking that the only place he could get the old-fashioned Country Dances was in Aberdeen. I don't know how much can be said for his dictum but it is symptomatic of the changes which rural environment is undergoing."

If these changes are real, as they are said to be, there is every reason that schemes in Rural Science should be wider in application, and less biassed. Perhaps,

the schoolmaster's plea that local circumstances should determine the nature of the Course has much to commend it.

Where the aims of the teaching are;

- a. To awaken and develop the spirit of inquiry in the child,
- b. To secure mental training through manual activity,
- c. To reveal to the child the significance of his surround-

ings, there is every reason to assume that success will only be attained when consideration is given to all the facts of locality as the basis of educational development. The contacts between the school and the environment, between Rural Science and the other parts of the school curriculum, should be natural and unbiassed. Where relations can be established without being forced, there are distinct gain and enrichment to the instruction of the school.

Even under existing circumstances the little school of Banchory-Devenick has accomplished much. The difficulties inherent in the organisation of the small school-- the demands of other subjects and classes, the lack of teaching power--- have been partly overcome by a judicious alteration of Time Table. The arrangement has apparently shown that the teaching of Rural Science need not suffer more than that of all other subjects of the Advanced Division Course through multiplicity of classes in rural schools, as long as careful preparatory work is done.

The experience of the schoolmaster has demonstrated that interest has been created and sustained, that opportunity has been afforded for breaking away from the traditional methods, that by means of the use of observation, demonstration, and experiment, the spirit of inquiry has been evoked and the significance of environment revealed.

The aims could not have been realised under traditional methods of instruction. They will be more fully realised, perhaps, when ampler provision by way of staff and equipment is made. In the schoolmaster's judgment, Rural Science may yet become an important aid to rural communities in the organisation of their economic life.

In the second class of rural school, that staffed by four or five teachers, two types may be distinguished, one lying within the purely agricultural area, the other within a district partly agricultural and partly industrial. To the former type belongs the school of Mulben in Banffshire in the work of which may be found evidence of the changes made to meet inherent difficulties. The school has a total Roll of one hundred and nine, and there are four teachers. In the Advanced Division at date 1929 there were two classes, First and Second Year, the former comprising two boys and five girls, the latter three boys only, the majority of whom were likely to

follow agricultural pursuits in later years. Both boys and girls are taught Rural Science, but the boys alone carry out experiments in the school garden, the girls being engaged during the period at Cookery and Laundry-work.

The original scheme, compiled for the County, has undergone considerable changes, the principal of which has been the elimination of what belonged more properly to a scheme in Physics, and the inclusion of more agricultural chemistry.

The principal difficulty experienced has been that of teaching two small groups of pupils-- First and Second Year Advanced--- with least confusion and disorganisation of the normal school arrangements, time at disposal, accommodation, and equipment constituting limiting factors. To overcome this obstacle, the scheme was rearranged in 1926 so as to allow both groups of pupils to be taught together. Instead of a First and a Second Year Course, the system was adopted of dividing the matter of the scheme into two parts, A & B, to be overtaken in alternate years. This method has been tried in several schools, but it has been reported that a return has been made in many cases to the former method whereby classes are taught separately. Possibly it has been found that

the arrangement necessitated the inclusion of subject-matter entirely unsuited to the mental capacity of the child or to the stage of development which he had reached. Without modification of the scheme it seems hazardous to arrange the parts thereof on a method of alternation. It is difficult to safeguard, for example, that a First Year pupil shall receive instruction in matters which he can understand and not in those designed for the pupil of maturer years and knowledge.

When the original scheme was introduced, a change was also made in the method of conducting outdoor experiments. The older method of dividing the school garden into plots, each allocated to a pair of boys who performed the necessary cultural operations on their own patch according to plan, was superseded^S by an arrangement whereby the whole ground was utilised for definite experimental work on a broader basis. The work out of doors then became subsidiary to that of the class room, and its purpose was largely supplementary. This arrangement constituted a complete veer to the opposite extreme. It is questionable, however, whether this upturning of the balance is advisable. Criticism may be made that, according to the nature of the instruction expected in Advanced Division Classes, outdoor work should receive equal

attention with laboratory experiments and observational work, that unless the balance is retained between the outdoor and the indoor, between skills and knowledge, there may be the danger of the work becoming biassed on the theoretical side.

In the latter type of school may be included the little school of Friockheim, Angus. This has an average Roll of One hundred and ten, of which not five per cent enter agricultural employment in later years. There are usually from fifteen to eighteen pupils in the Advanced Division undergoing a Course for two years. The school is staffed by a Headmaster and three assistants.

In 1925, a scheme of practical instruction was begun, based mainly upon the agricultural aspect of the environment. It was a scheme devised to benefit those pupils who intended to follow agricultural pursuits. It was soon discovered, however, that the intention of the scheme was defeated by the fact that few boys took to farming, and the scheme had necessarily to be recast.

The school is situated in an area partly rural and partly industrial. The industry, more or less moribund, is yarn bleaching, and while the parents of some pupils are engaged in this industry, no boys have been employed in the mills for several years. The question of practical education in such circumstances can scarcely be considered to centre in the prevailing industry,

and whatever reference is made to environment must necessarily have a cultural influence, with , perhaps, an effect upon social life.

The present aim of the schoolmaster is to provide a Two Year's Course in elementary physics and chemistry. In this there appears a reference to the facts of neighbourhood , such subjects as soil cultivation, manuring, being included in the Course. This has been done to enable the pupils to understand many of the simple facts of nature and to encourage the improvement of home gardening.

The school garden, hitherto utilised for the purposes of experimental work, has been given over to the cultivation of cottage-garden crops. This has been done in order that the school may have a socialising influence. "In a village like Fricockheim", writes the schoolmaster, " We want to encourage our boys, and girls too, to take a real interest in their own gardens. The tendency today is in the other direction". He considers that the pupils derive more benefit from the practice of cottage gardening than from experimental work of a definite kind carried out in the garden plots. "It is better to show a boy how to grow a turnip successfully than how not to grow it". This conception of the aim of outdoor work does not obscure the fact that in the performance of the duties involved in digging, sowing, and tending the garden crops, skills are developed

and ideas inculcated which have a value of a greater social importance. It does not exclude the possibility of providing an education which shall equip the individual for a wider sphere of life. This point is made certain by the fact that the scheme of indoor work makes provision for observational work and for experimentation related to the facts of neighbourhood, and yet of such a kind as will prove educationally advantageous.

The value of the work at Friockheim cannot wholly be estimated by the enlarged interest which has been shown by cottagers in the cultivation of their garden ground. It can only be estimated in later years when the results appear within a community of men and women of enlightened ideals.

One of the most outstanding experiments in rural education in Scotland is being carried on at Duns Public School, Berwickshire. The experiments owe their origin to the enthusiasm of the schoolmaster, who, during the period of the Great War advocated Horticulture as an emergency utility service. The School Board of the time was unprepared to institute School Gardening, but they readily complied with the suggestion that the boys of the school should dig and tend the gardens belonging to villagers on active service. The work thus

begun became a project through which the knowledge of cultural methods made special appeal as a form of war service, and the success of the venture at length constrained the schoolmaster to launch upon a scheme of practical rural education after hostilities had ceased and the need for war service was at an end.

The school lies in the midst of an agricultural area and thus serves as a centre of influence to a large farming population. At the end of the year 1919, the Census Returns of young persons between the ages of fourteen and eighteen disclosed the fact that in Berwickshire the number of boys and girls leaving school to take up some form of farm work was greatly in excess of the number passing into any other form of employment. This fact suggested the desirability of instituting a practical Course of instruction in the school. It was also deemed advisable that health-giving hobbies should be encouraged so as to remedy a defect in the educational system of the time.

The scheme was begun on the 21st. March, 1921. The Edinburgh and East of Scotland College of Agriculture was favourably disposed towards it, and Lecturers attended the school during a period of two years to give instruction to the pupils in Horticulture, Agriculture, and Poultry-keeping.

Half an acre of meadow land was procured. This was ploughed and set with potatoes, preparatory to a lay-out scheme. It is interesting to note that the return from the crop more than met the expenditure in connection with the operations for the permanent lay-out of the ground and also the cost of a number of fruit trees, bushes, plants, seeds, and manures.

The Course was designed to give instruction in Agriculture, Horticulture, and Poultry-keeping. It aimed at a balance between outdoor and indoor work, but the success of the indoor experiments has been curtailed by lack of proper facilities.

The ground allocated for experiments with agricultural crops was divided into sections. In the main section, during 1922, special tests in potato growing were carried out. In 1923, the following farm crops were sown-- two varieties of each-- wheat, barley, oats, mangel, and turnips. These provided lessons in seed sowing, harrowing, rolling, and manuring. Miniature plots were sown with the chief farm grasses and clovers. The exact nature of the experiments can be observed in the detail given below;

1. Potatoes at different depths.
2. Potatoes at different distances.
3. Potatoes, sprouted versus unsprouted.
4. Potatoes, manured versus unmanured.
5. Potatoes, cut sets versus whole sets.
6. Potatoes, large versus small sets.

7. Potatoes, unhoed.
8. Seeds-- depth experiments--
9. Seeds, distance experiments.
10. Experiments in tillering.
11. Experiments in plant feeding.
12. Rotation crops on manured versus unmanured soil.

The main area reserved for practical horticulture was divided into ten separate plots each measuring thirty feet by nine feet. In each of these plots the chief garden crops were grown in rotation, the care of a plot being the special duty of a pair of boys during the year. Around the main section run borders reserved as fruit plots, wall plots, propagation and nursery beds, experimental plots, and rock garden. In the centre of the garden where the intersecting paths meet, a small circle of grass was laid and reserved for meteorological instruments. A continuous border two hundred and fifty feet long was set aside for typical genera of the ninety four natural orders obtainable in Great Britain. An appeal was made to gardeners in the neighbourhood, and as a result this section has become a very valuable adjunct to the study of Botany. A fruit plot was planted with :- forty five apple trees, three pear trees, two plum trees, nineteen blackcurrant bushes, thirteen red-currant bushes, and twenty six gooseberry bushes.

Routine work in the garden included pruning, spraying, and propagation, over and above the ordinary cultural operations.

In 1923 the following experiments were carried out in the

Horticultural section;-

Effect of Sterilisation.

Crop grown on soil versus crop grown on sub-soil.

Crop grown on cultivated soil versus crop grown on uncultivated soil.

Potatoes planted on the 15th. of each Month, to note times of first appearance, first flowers, rate of development, yield.

Thinning versus non-thinning of crop.

Potatoes- equal number of sets of many varieties, to note characteristics of foliage, haulms, flowers, tubers, freedom from disease.

Peas-- dry versus soaked.

Fruit trees in cultivated soil versus fruit trees in grass.

Weekly readings from ground thermometers of cultivated and uncultivated soil at different depths.

Daily barometric and thermometric readings; weather notes.

From the total area of half an acre, four hundred and fifty square yards were fenced off as a double poultry run. A small tool shed was converted into a hen-house to demonstrate that an ordinary outhouse can be made a satisfactory abode for fowls, provided that due attention is paid to the following points;- moveable nest-boxes, perches and dropping boards, ventilation without draughts, and satisfactory lighting of the floor area. Thereafter, a new hen-house was erected with some novel arrangements. As a result of these experiments, local poultry-breeders remodelled their hen-houses and commenced the selection of breeding pens on more satisfactory lines.

Routine lessons in Poultry- keeping dealt with;-
Housing, ventilation, cleanliness, lighting.
Size, cropping and cleanliness of runs.

The brooding hen and its management.
 Chickens-- hatching, feeding, and management.
 Incubators and brooders.
 Breeds of poultry.
 Poultry foods.
 Egg production.

Practical lessons were given in the runs. Indoors, regular instruction was imparted in weighing, mounting, charting, and in the estimation of costs and the recording of income and expenditure.

All three subjects provided many opportunities for related work. The woodwork lesson, given in the Hand-work Room at the High School by a specialist teacher, was utilised for much constructional work including the making of gates, plant labels, fitting for science experiments, etc. The Arithmetic lesson often dealt with areas, measurement of quantities, costs for seeds, comparisons, and relative values.

Such a scheme, arranged for a complete Two Year's Course, meets the needs of an agricultural County like Berwickshire. It contains much that is worthy of a place in any broad system of rural education. Its use of immediate environment is based upon the central idea that Nature makes ample provision for a natural system of education, that round about the school lies all that is necessary for arousing interest and sustaining it, that as the whole world is an outdoor laboratory, there is little need for artificial apparatus and the general trappings of the

traditional school. The test of the methods employed lies more in the revelation of interest and the sustaining of activity than in any possible examinable results. The most striking feature of the experiment is its power to influence the old school subjects. These become illumined and appear quite different, unassumingly important as means towards a practical end. It is scarcely surprising to find that in the Official Report of 1923, (I) it is emphatically stated;- "This is surely sound education as well as good husbandry; instruction cannot but be more effective for the stimulus given by the consciousness of immediate utility."

"The mere spectacle of the cheerful activity reigning at this Centre, accompanied, as it is, by a proportionate outcome of positive results, is in itself sufficiently interesting. Much more interesting and important, however, is the consideration of the point of view from which the whole of the teaching is directed. Although necessarily elementary and simple, the instruction is thoroughly scientific in spirit. The pupils, instead of being merely shown how to note and use empirically the results of various recognised and well-tried operations, are taught all the time to pursue the study of

the principles which govern these operations, and, in doing so, they acquire, not only a body of positive knowledge, but, what is much more important, permanent habits of attentive and intelligent observation which should be of the greatest service to them in the future."

" A brief word of acknowledgment is due to the resourcefully economical way in which the whole of this Course has been started and carried on." (I)

The enterprise has been all along entirely self-supporting. The manufacture withing the school of what is required for the purposes of both garden and class room has spared the management the expense of purchase. The sale of produce marketed locally has sufficed to do the rest and leave a balance in hand. A Financial Statement for the Course, submitted in 1923, showed the income to be Ten Pounds Thirteen Shillings and Five Pence, made up as follows;- Balance from previous year- £1-6-5; Sale of early potatoes- £1-6-6; Sale of vegetables- £2-4-4; Maincrop potatoes- £5-8-0; Wallflower- 2/4; and Seedlings- 5/10. The total Expenditure was Eight Pounds Nine Shillings and Five Pence, made up as follows;- Bedding out plants-4/8; Onion plants- 5/9; Jobbing gardener, employed during August- £2-7-6;

(I) Report of C.C.E.-- G.R., 1923-- Southern Division, Page 21.

Advertising two Public Demonstrations at School Garden- 8/6; Seed potatoes- 15/8; 200 plant labels- 2/8; 1 cwt. wire for special plant labels- 18/1; Staples- 4/3; Paint, turpentine and varnish- 9/6; Six lamp funnels for experiments- 3/6; Carting soil, manure, and refuse- 8/-; Stakes for wire netting above wall- 12/6; Vegetable and flower seeds- 11/10; Two apple trees- 10/6; Repairs and renewals- 5/2; Postages and sundries- 1/5; leaving a balance of £2-4-5.

The success of the enterprise is due almost entirely to the zeal of the schoolmaster. Starting from the days of the Great War, he has been able to build up a system of practical education which has already had far reaching effects upon the rural community. The interest manifested in the work of the school by farmers has led to changes in agricultural methods and to the spread of enlightened opinion as to the value of the modern rural school. The effects upon cottage-gardening, upon the attitude of the home gardener to the value of a knowledge of modern method of horticulture are due to the pioneer work which has been carried on in the local school, often under difficulties, but always with enthusiasm and with the abiding idea of uplifting the community.

Chapter Seven.

"The Queensferry Experiment. "

The history of the Queensferry experiment is marked by gradual developments from vocational to educational ideals, by successive changes in educational outlook, by changing conceptions of scope and of method. These developments have appeared as results of a fuller understanding and appreciation of immediate environment and of the pressing needs of the adolescent. A survey of the neighbourhood, both from the purely vocational and from the essentially social standpoint, has largely determined the present aim. It has demarked the nature of the instruction which should be given and supplied the background for tentative efforts in the sphere of rural education which aim at supplying a complete system capable of satisfying the needs of the adolescent.

The experiment was begun in the year 1922 as part of a system of Higher Education designed for pupils of the 'practical-minded' type, in contradistinction to the so-called 'academic'; in order to provide an education closely related to the direct needs of the community. These needs were regarded as bearing directly upon the rural antiquities of the Parish, upon agriculture in particular, although occupational interests were not entirely

vested in farming. The point of directing special attention to the land and to the possible benefits of emigration, both from the individual and from the national and imperialistic point of view, constituted a factor in producing particular bias to the Curriculum. It was assumed that agricultural pursuits were of paramount importance locally, that they were worth while both to the individual and to the State, and that the outlets for agricultural labour were readily available either in the home Parish or abroad. The assumption was based entirely upon historic notions of neighbourhood. It was founded upon the fact that, historically and geographically, the Parish might be regarded as purely rural in its economic aspect. But the assumption neglected the existing facts of parochial distribution of occupations and the diversity of community interests.

The school lies within the Parish of Dalmeny in the County of West Lothian, and on the borders of the Royal Burgh of Queensferry which it mainly serves. In 1922, the Parish of Dalmeny held within its bounds a Shale Oil Works which yielded employment to a considerable number of parents. But this industry in oil production was on the decline and was likely to become moribund, and this fact may have warranted the neglect of the industrial factor, but it could scarcely give assurance to the belief that agriculture constituted the main source of employment in

the neighbourhood. Most of the pupils in the school were the offspring of workers who followed different occupations. Many of them resided in the Burgh of Queensferry where occupational interests varied considerably.

The centring of interest upon rural pursuits led the school authorities to regard the subjects of Agriculture and Horticulture as of paramount importance, and these subjects were introduced with a vocational or quasi-vocational intention. The scheme of instruction, intended for the boys in the First and Second Year Advanced Classes, was drawn up by the Edinburgh and East of Scotland College of Agriculture. It was necessarily tentative and was, perhaps, over-ambitious and biassed towards vocational practice, although it embraced much that was of value from the standpoint of general education. It made provision for a school garden of about quarter of an acre, comprising two main plots of ground, an agricultural and a Horticultural, both one hundred and ten feet long by thirty feet wide, a small fruit plot, an herbaceous^e border, a small rock garden, and a propagation border. The main plots were divided into ten sub-plots, thus providing sufficient ground for twenty boys working in pairs. In the agricultural section farm crops were grown. Sub-plots were sown with cereals, grasses, turnips, potatoes, etc. and these were subjected to treatment according to

the practice of the Agricultural College. In the Horticultural section a complete garden rotation was laid down and experiments were tried with definite objects in view to demonstrate the principles and the necessity of correct culture. The outdoor work in agriculture was intimately related to farm practice, while that in horticulture had a definite reference to market and cottage gardening. In both schemes of work allowance was made for the carrying on of indoor experimentation and observational work closely connected with the operations of the field and garden. To effect this purpose, a class room was altered to suit the purposes of a laboratory, and the necessary equipment was installed.

In the initial stages, the teaching of both agriculture and horticulture was entirely in the hands of the staff of the Agricultural College. A Lecturer in each subject was employed for a period of two hours per week during which time outdoor and indoor work was carried on, the proportion of time devoted to each section of the work being determined by weather conditions.

There was a Course of Woodwork, besides, which was taught by a member of the Education Authority's peripatetic staff, but at first it was entirely unrelated to rural pursuits. It had no bearing upon the Courses in agriculture and horticulture, as it followed the lines of

a Course designed for urban schools, serving the needs of the community only in so far as these touched certain restricted aspects of home life. Although opportunities for establishing a relationship were not wanting, and although a wide field of activity and of interest lay open whereby much in immediate environment, ~~in~~ in occupation, and in general social life might have been more intelligently comprehended, no attempt was made to break with tradition and to apply principles and methods to a wider and more general practice. This was unfortunate because the methods employed hindered not only the expansion of Handwork as a subject in itself but also the development of a complete system of education based upon conceptions of intimate relationship between the school and the environment. They created a hiatus and aggravated the evil of subject- compartmenting which already existed in the Rural Course. Where Agriculture and Horticulture were taught by separate Lecturers, Woodwork might have effected a change in outlook and established a link between both subjects .

The distinct traces of compartmenting which existed in the Rural Course had a somewhat deterring effect upon progress towards a unity of aim. There was evidence of the clashing of interests and of the over-laying of subject matter. Where the experiments, demonstrations,

and lectures in each of the subjects of Agriculture and Horticulture were carried out independently with a minimum of reference and inter-relation, over-lapping could scarcely be avoided. It occurred where both Lecturers experimented with the soil and with the plant. It occurred when outdoor occupations were in progress. The same principles and similar methods of culture were being demonstrated perhaps twice in the week by different teachers, and although revision might have had its advantages, time was lost and opportunities for further progress were lacking. This lack of complete co-operation created a system of subject-compartmenting which could not have existed if the aims had been unified and the view-points had coincided. The existence of two vocational aims, the one agricultural, the other horticultural, presupposed the existence of two separate subjects of relative importance. It militated against positive inter-relations, and created false impressions concerning the value of the true educational end.

It soon became apparent that this divorcement or determinate separation of subjects was detrimental to unification of the scheme as viewed from the purely educational standpoint, that it stood in the way of a coherent system of education. The principles underlying both agricultural and younger preparation, no desire to separate.

culture and horticulture were similar, although the crops might differ, and there seemed no purpose in duplication of treatment as far as the educational value of the separate subjects was concerned. If the matter of the Course was to be compacted and welded so as to create a system or method of education commensurate with social needs and individual development, there was little need for the divorcement of subjects or the creation of artificial barriers to inter-relations. It was apparent that whatever matter might be introduced must enter into the system as an application of principle and practical illustration, both valuable as links between the school and society creating a broader social outlook for education.

At the end of three years of tentative effort, the two Lecturers were withdrawn and the visiting teacher of woodwork was transferred. At this point it was believed that the system established would work its way and with expansion the value of the project from the vocational aspect would manifest itself in increased local interest and trend towards agricultural pursuits. The expectation, however, was never realised. Publicity, through Exhibitions of work and Press notices, could not even induce farming populations to take an interest in the work of the school. There was no evident demand for farm work among the younger generation, no desire to emigrate.

The true results of the experiment could only be discerned in the interest displayed by the pupils, in the adaptations and skills revealed when the project was pleasing and the lure to complete the allotted task was strong. These constituted results of greater importance than those which could be computed by a survey of probable farm workers.

Two factors contributed to the acceptance of a wider aim,-- increase in the number of boys in the Advanced Division of the school, and the provision of a qualified permanent staff. The former necessitated the acquisition of more land. The latter proved the influence which made possible the attempt to create a complete and unified system.

To meet the demands of the Division, an area of three quarters of an acre was added to the existing garden area thus making a total acreage of one acre. The new ground constituted part of a pasture field. It was ploughed and cropped with potatoes preparatory to a definite lay-out. After harvesting operations were completed, the work of construction and of reconstruction was begun by the boys. New plots were staked off, edgings of brick inserted, paths dug, bottomed and finished. The whole ground was more or less levelled, lawns were sown, a shrubbery plant-

ed, and other tasks undertaken. On completion of the work there were six main plots, five subsidiary plots, an enlarged order border, a nursery, a fruit plot, and a large rock garden with a pool. The undertaking, ambitious though it appeared at first, proved the key to the situation. It gave lead to a new conception of the aim. Our problem now appeared to be, not the imparting of special information which might become a determining factor in occupational guidance, but the creation of an environment in which the individual might develop as naturally as possible. This view found greater favour when consideration was given to parental occupation and the possibilities of employment within the Parish and neighbourhood. A survey of the distribution of occupations within the bounds of the Parish, as far as such affected the school population in the Advanced Department, revealed the fact that, taken over a period of six years, agricultural pursuits absorbed the labour of only twenty four per cent of the male parents. This percentage included males engaged in rural occupations outwith farm work,-- estate workers, blacksmiths, and the like. The remainder represented those engaged in casual labour, building trades, railway work, and other occupations.

Statistics have since shown that between the years 1922 and 1928, the number of boys taught under the new system who either elected or were absorbed in farm work , in gardening, or were employed on estates, amounted to forty, an average of 6.7 per annum. This was the position in spite of the fact that the Shale Oil Industry had become moribund, and that during the six years under review the industry had absorbed no boy labour. The inference was that farming offered few openings for employment, and that where such openings existed they were filled by the children of farm servants. This inference found corroborative evidence in a further survey carried out with a view to ascertaining whether the land within the bounds of the Parish could absorb more labour. The acreage of agricultural land amounts to some 4,340, and the number of workers actively engaged in farm work during the year 1929 totalled 166. This represents 38.2 workers per 1000 acres. Individual farmers were emphatic that the land under cultivation was unable to absorb an increase , and that labour was probably in excess of actual economic requirements. The average number of agricultural workers throughout Scotland in the year 1929 was computed as 26per 1000 acres. (1) This figure appeared to con-

(1) Scottish Journal of Agriculture-- Vol. xii, No. I, January 1929, Page 33.

firm the opinions of the farmers and convinced us of the fact that the possibilities of employment on the land were at least remote, as far as the larger number of boys in the school was concerned.

Consideration of these statistics and opinions gave weight to the argument that the aim of our experiments in rural education could scarcely be regarded as direct preparation for any specific occupation, if blind-alley employment was to be avoided. It clarified the conception that the only solution to the problem lay, not in the acceptance of immediate environment as merely so much land to be tilled and made productive, but in the view that school neighbourhood and the rural group are integral parts of a larger environment, the understanding and appreciation of which may lead to a better conception of all that underlies human activities and social relationships.

We realised that environment is only limited by capacity, by the urge of individual will, and by opportunity; that it may be futile to attempt concentration upon conservancy of rural interests where modern life is in expansion, where the links between rural and urban social groups are so strongly welded by the influences of modern intercourse and interdependence. To hitch the ambitious and the capable individual to the plough could only lead to disaster, when the call of

ambition, the will to succeed, and the capacity to overcome were clamant and strong. We could not guarantee that the individual, although reared in a rural atmosphere and educated expressly for the country life, would remain in the rural social group when school restraints were removed. We were thus compelled to seek a solution to the problem which would break with the traditional and in effect would eliminate the Parochial and the vocational.

Two aspects of the situation were considered, the one emerging from a new conception of the meaning and the purpose of environment in the educative process, the other from appreciation of the nature of the individual. Study of immediate environment, carried out in order to ascertain to what purpose, to what ends, and by what means the best in environment could be utilised for the purposes of the educational end, showed that there are facts and principles common to the progressive life of all social groups, and these are embodied in the natural and social life of the district. To focus interest upon these, to utilise them so that they carried a socialising purpose became our object.

As a starting point our purpose was to reveal nature in all her immensity, regularity and beauty,

to incite curiosity which would satisfy the urgent spirit of adventure already awakened in the child by the forces of his own adolescent nature. We realised that the child was passing through a period of reconstruction following upheaval, a period in which lack of co-ordination was apparent in both bodily and mental life. It seemed our duty to present scope for healthful activity, an activity which appeared worth while, something that promised results of personal interest, and yet of value as an agent to readjustment and harmonious development. Here was a garden, possessing many features of the larger environment, suggestive of activity and interest, an outdoor laboratory in which he might experiment, in which he might endeavour to probe the secrets of things of which he had only a shadowy knowledge. It was no longer a garden designed to offer him expert knowledge about agriculture or even of horticulture, for the names of the plots had all been changed. In it the child learned by experience, by observation and experiment, the methods by which man contrived to help nature in the work of perfecting various species in the vegetable kingdom. The science of sowing seeds, the gracious work of thinning a crop to relieve the struggle for existence, and all the operations known to the amateur gardener but perhaps seldom understood, were regarded as teaching lessons which aided inculcation

of correct habits of thought, of action, and of will. It was worth while being tenant of a plot, worth while digging it, worth while searching into the secrets of its kindly loam, and worth while tending the gracious plants that grew as interest grew. The garden proved a pleasant place for thought and a place of inspiration.

Under the new system the garden plots were arranged for various minds, and for various moods., and they were thus intended to exert a moral as well as a mental influence on the mind. At every turn of the garden path there must be something to arrest attention, something to stimulate tendency, something to develop will. To this end we laid out the plots as little gardens expressive of virtues and graces. There was the Garden of Generosity where the food stuffs grew; the Garden of Beauty, the home of the roses and the gay and friendly flowers; the Garden of Perseverance, where types were cultivated; the Garden of Thrift, where economy was practised in space and by the use of waste products; the Garden of Enquiry where cross polination was effected; the Garden of Discipline, where the pruning knife points the lesson; the Garden of Selection, of types, of character, where hybridation points the moral; the Garden of Experience, the demonstrational plot; the Garden of Order, where plants in species grow; and the Garden of Sympathy, the rock garden,

where needs are studied and help is given to many a species that blossom far from their native haunts. The moral is there, unobtrusive. It is a method of working on the ideational level of mind, the creation of ideas with consequent sentiments, and who can say but that what is thereby gained by the child will lead to the rational level of mind where ideals and principles regulate the life. In the Garden of Discipline the child may understand the saying, "Every sin has its reward"; he may comprehend the full meaning of the Parable of the Prodigal Son when he observes the result of riot among the fruit trees.

The garden thus generally arranged as an environment of potential influences for individual development, providing opportunity to capacity, which is its greatest use, has become the ground on which experiments are carried out upon plant life as influenced by soil-medium, weather, and culture, without emphasis being laid upon agricultural or horticultural occupations. The sequence of the observations and experiments both without and within the school, in garden and in laboratory, is that exemplified in the story of Creation,--- the earth, the plant, the animal. Study of the soil, historically considered, assumes a study of rocks and the simple story of their formation; and from observations made in the

neighbourhood, from simple experiments in the laboratory, facts are gained concerning the agencies and the compensating features of nature. It is observed that although certain powers exert an influence to disintegrate rock masses and disperse the components, other agencies with compensating power are continually building up the fragments; that nature's law is worked out in the cycle of processes in order to conserve the just balance. This consideration of the denuding agents and their work naturally leads to study of the soil, its nature, its relation to weather, to air, water, and heat, which are important factors in the life of plants and ultimately in the life of man himself.

Such enquiry yields a knowledge, not only of facts pertaining to what exists in nature, but also of the principles underlying the nature of science itself. Scientific knowledge is observed as the outcome of a knowledge of natural law. Nothing happens without a cause. And all this sifting of knowledge, this probing into the secrets of process, this appreciation of cause and effect, helps to establish in the young mind the habit of correct thought, of searching, testing, proving, and balancing idea with idea, so that there may evolve a thinking child.

There still remains, however, the active and

volitional aspect. Correct activity is governed by the will. Morality, regarded as clean thinking, willing, and acting, is all important. Towards the moral end the study of plant life has an important bearing.

Starting from the point of view that all plants exist for the propagation of species, investigation into the structure and germination of seeds touches upon reproduction as a natural and necessary process, and this becomes the unconscious influence in the child mind towards the awakening of that spirit of purity which questionable methods cannot rouse. In the study of structure is hidden the nature of life and growth, the provision for dissemination, the idea that all things emanate from seeds, that life springs from life, an idea which is developed later into reproduction from cell. In germination lies the key to nature's orderliness and economy, orderliness in the processes of life, in the arrangement of parts; economy of space as shown in the size of seed compared with size of plant, in the arrangement of the young plant within the bud, and economy in work exemplified in the function of parts.

Study of the plant from the starting point of its independence, at the time when it has developed roots and pushed its leaves to air and sunshine, through all its stages of growth until it reaps its labours in fruit,

affords valuable lessons in morality. Independence is shown as the essential of individuality. To be an individual presupposes separation from parent ties, development of powers and capacities, growth of the self as a thinking moral being. To struggle on to attainment, battling against circumstances of environment, as the plant fights against strangling weeds and over-growing shrubs, is to mould character and make a man.

The summit of knowledge of natural process is gained when we complete the cycle of plant life. Fertilisation, treated simply as a process in plant life, without addition, has a direct bearing upon the nature of all life. The process is observed as natural and pure, natural because necessary, pure because it accords with assimilated ideas of the origin of life. Practical experiments carried out in cross and self pollination prove the necessity of pure stock. The study of sexual reproduction, of sexual cells and sexual process, awakens ideas regarding the inner meaning of life and its continuity. Sooner or later, the mind must come to perceive and realise that the processes in reproduction are natural and clean. The consideration of insect life furthers knowledge of sexual process, and demonstrates the necessity for mutual help.

In all this study, whether theoretical or practical, the aim is to interest, to stimulate, to devel-

op a reverence for nature and life. The inter-relation of earth, plant, and animal, when perceived, leads to the highest knowledge. The facts of reproduction, the processes of life in plant and insect inspire feelings of pure wonder and teach purity of action. In nature there is regularity with no license. Everything follows law towards the highest good.

The facilities for carrying on the work are ample. The garden is equipped with modern tools and appliances to meet the practical work of garden culture. There are Earth Thermometers, Maximum and Minimum Thermometers, Wet and Dry Bulb Hygrometer, Barometer, and Rain Gauge appliances. With the aid of these, daily readings are recorded and conclusions drawn with regard to weather conditions. The boys have built garden Frames and an incinerator. They have helped in the construction of a synthetic manure platform and tank. They have helped to erect fences and make gates. In 1926, a new Laboratory with a Workshop and an Art Room were added to the existing accommodation. These are well equipped for the work of the school. In the Workshop there are many tasks undertaken with interest and zest. We have utilised Handwork as the handmaiden of garden and laboratory activities. It is recognised as part of the project of all work, inculcating useful social habits. We believe that rural as well as urban life has many aspects. There are

skills fundamental to all civilised life which require development as well as skill in husbandry, and the more connections we can make with the life and activities of the social group the wider will be the development of the individual. Skill in crafts is an associated skill and a valuable ally to all occupations. It is a necessary skill for life. Holding to this view, we have tried to broaden the outlook of the subject of Handwork. We have endeavoured to give consideration to the use of media and materials seldom utilised, perhaps, in the traditional school- workshop. Work is carried out in wood, in metal, in raffia, in cement, and in brick and lime with the intention of developing skills and inculcating habits of thought which have a socialising influence, and much of this work is accomplished as the result of a project, created by the pressing need of the moment. The garden dictates many such projects. Many objects of interest and use are made in wood as the result of a felt need---- plant labels, pegs, pea- protectors, etc. Many are wrought in iron--- scoops, trowels, line pins, and such like.

Knowing that the constant presence of will is at the root of all effort, rather than pre-arranged simplicity of occupation, we tried to give wholeness to the child's activity. Where the child caught the spirit

of suggestion and wished to perform the work there would be effort with success. The most valuable part of the task, perhaps, was that undertaken along with fellow pupils or towards the general work of completion. The intention, the sustained effort towards success, created initiative. It called for motivation along several lines of thought and action, and where that was hindered or where the flow of effort slowed for lack of inspiration, some deviation from normal procedure was entertained and fresh means adopted. Consultation with neighbours as to further procedure, the seeking of help or advice, was the means of creating social organisations and of evolving leadership in the group. The work of co-operation led to group consciousness and social relationships were established. Social organisations were formed naturally for the purpose of solving group problems.

Recognising that education, from the pupils' standpoint, is the process whereby the mind is exercised in making knowledge for itself in socially profitable ways, and from the school standpoint, that it is the process of providing conditions necessary to this end, we are of opinion that the teacher's function is to arrange environment. This does not imply that this arrangement should lessen the child's task. It should be such as to

yield opportunity for the maximum use of mind with restraint necessary^a to economy of time and of energy. This means direction of the child-mind to facts related to purposes and to approved method of handling them so that his freedom may be the acquisition of knowledge as inner conviction. Our aim is to give independence under guidance of ideals and principles. These can only be evolved by the presentation of purposive acts and experiences, of methods of acquiring them. If the school is to serve its purpose in the development of a worthy social being, it can only do so by recognising freedom under such restraint, freedom in the development of capacity, and encouragement of tendency along the lines of ordered guidance, where outlets are given by arranging that what is presented is the best conceivable within the limits of environment. We believe that we can stimulate thought by surrounding the child by problems and the reasons for their solution, that we can check harmful tendency, that we can conserve mental energy, and in the end that we can make him free to choose his own problems and to solve them according to the highest social ideals.

Questions. The outlets to development are still on the increase. The school garden, the laboratory, and the workshop, do not now embrace all the avenues. The near environment has been surveyed and the work is still in

expansion. We have already overtaken a survey of the school garden. We have identified and written about all the trees and bushes and weeds. We have sampled and analysed the soil. We have studied the weather regularly for a period of years. We have gone out to the neighbouring fields and surveyed the flora, so that we now have at hand a valuable record of plant life existing around the school. We are collecting to form a herbarium and we contemplate recording observations of bird and animal life. With the assistance of students a survey of the whole Parish of Dalmeny has been commenced. The geological formation has been studied, and statistics have been compiled regarding farm lands and buildings, acreage, field names, farm stock and implements, markets, rural population, industry, communications, and such like. In addition, a short History of the Parish has been written. These enquiries have been prosecuted with a view to establishing an interest in social life and neighbourhood, with no thought for agriculture itself. In the prosecution of the studies, interest has been quickened, and the work has proved a valuable influence in establishing social connections.

The school has an average Roll of four hundredpupils of whom about one hundred are in the Advanced Division. ^hTere are usually nearly fifty boys and all of these take the Rural Course which extends

to three years. The Staff of the school is ample. There are three teachers, including the Headmaster, with qualifications in Rural Science and Handwork, so that the work of the Course is carried on without the assistance of a peripatetic staff. It has been found that this self-sufficient arrangement is best. It eliminates the chief obstacles to progress. The questions of time at disposal and of opportunity to carry out practical work do not arise. The obstacles due to weather can be overcome by a departure from the normal Time Table which is legitimate from the true educational point of view. The fact that the teachers of Science are also the teachers of Handwork and of other subjects makes not only for increased efficiency but also for opportune activity on the part of the pupil. Teachers can adapt the work to suit the circumstances that arise, and so the garden, the Laboratory, the Workshop, and the Class room can be related most naturally. It is found possible to work upon a Project Method under such conditions and to relate the school activity more closely with home pursuits, such as cottage gardening and hobbies of various kinds. It is not unusual to find boys employed in the Workshop of an evening working out practical problems that have originated in the home environment. It is our custom to encourage such activities and to

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foster the belief that the school is the centre of community life . This enthusiasm on the part of the pupils has perhaps been the result of the extended interests of the teachers themselves. The influence, permeating through extension of view and application to various aspects of school work, has been felt by the pupils, and this broadening of sympathies and interests has created ideas of relationship and of social uses which are of the highest value. The success of the experiment is only revealed in the unconscious behaviour of the boys, in moments when they show expansion of power, a sense of the true value of co-operation, healthy competition, imitation, suggestion, and helpful instruction , which constitute the specific influences in social environment. If, as we hope, we are serving a social purpose and at the same time developing individual capacity, inculcating correct habits of thought, of action, and of will, we believe that we are accomplishing a useful purpose and solving the problem of education in an environment of diverse interests and of varied social needs.

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